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# Technical Association Meets at Richmond

## Fall Convention Is Attended by Nearly Three Hundred Technical Men From Representative Pulp and Paper Centers From All Over This Country and Canada—Reports From The Various Committee Chairmen Show Increasing Interest In The Work of the Association—Washington Is Visited—Those Who Attended

[FROM OUR SPECIAL CORRESPONDENT]

RICHMOND, Va., September 30, 1929.—Attended by nearly three hundred pulp and paper mill executives, superintendents, engineers and chemists the fall meeting of the Technical Association of the Pulp and Paper Industry was held on September 24 to 26 in Richmond, and on September 27 in Washington, D. C. The two famous and historic capitals had much to offer to those who attended the meeting, so much so in fact that many took advantage of the opportunity presented to spend several days before and after the meetings visiting the many shrines of natural and historic significance in the mountains and battlefields of the Old Dominion, the mother state of so many presidents and distinguished statesmen and soldiers.

### President Glatfelter Presides

The first general session opened with P. H. Glatfelter of Spring Grove, Pa. as meeting chairman. A review of the activities of the seventeen committees of the association reflected the enthusiastic manner in which these voluntary groups continue to study the important problems relating to the manufacture of pulp and paper and the control of its quality.

### Meeting Place and Local Committee

All the meetings, banquets, etc. were held in the famous old Jefferson Hotel which is said to have the largest lobby of any hotel in America and is well equipped with convention facilities, having a large auditorium and many adequate conference rooms.

Under the leadership of B. K. Steadman of the Standard Paper Manufacturing Company, general chairman, the local convention committee worked out the ways and means of making the fall meeting a success. Associated with Mr. Steadman were the following: O. L. Schweichert, Bedford Pulp and Paper Company, chairman of the administration committee in charge of finance; H. S. Donald, Standard Paper Manufacturing Company, sub-chairman in charge of registration; J. R. Diggs, Albemarle Paper Manufacturing Company, chairman of program committee; J. P. Massie, Albemarle, sub-chairman in charge of golf tournament, G. A. Carlton, Standard, chairman of arrangements; A. L. Rothschild, Standard, sub-chairman in charge of divisional meetings; B. W. Coale, Albemarle, chairman of ladies committee and John A. Carter, Richmond Chamber of Commerce, chairman of publicity.

The enthusiasm and ability of this committee was demonstrated by the smooth procedure of events throughout the meeting.

The Cellulose committee of which John L. Parsons of the Hammermill Paper Company, is chairman reported plans for the annual meeting in which it is contemplating a joint session with the Fine and Special Papers Committee to discuss factors influencing permanence and durability of paper. A review of developments in the chemistry of cellulose will also be given. Dr. Jessie E. Minor is chairman of the Fine and Special Papers Committee.

A. T. Gardner of the Combined Locks Pulp and Paper Company reported for the Training Committee that ways and means are being studied whereby the Technical Association can assist qualified technical schools in the preparation of men for the industry. The committee recommended the establishment of a central agency under the direction of one person to direct the entire educational program of the industry.

### Paper Testing Program

B. W. Scribner, chairman presented the following report for the Paper Testing Committee:

Proposed revised official methods for determination of fiber composition of paper, content of paraffin, and content of starch were prepared by the chairman for final consideration by the Paper Testing Committee.

The cooperative laboratory work of the sub-committee on microscopical determinations showed that the dot-count method was suitable as an alternative method for determination of fiber composition of paper, and the method has been revised in this respect.

The changes proposed in the methods for starch and paraffin were recommended by the sub-committee on chemical methods, after cooperative tests by several laboratories which indicated that the changes would add considerably to the accuracy of these methods. The method for paraffin as revised makes provision for quantitative separation of paraffin from other constituents commonly found in paper. In the method for starch, the modified Fehling's solution and the Benedict's solution eliminate the necessity for the use of indicators and give a much more definite end point. Moreover, the modified Fehling's solution is the same as that used by a number of laboratories, for determination of copper number of paper, and therefore, the use of it eliminates the necessity of having two different Fehling's solutions where copper number and starch determinations are both made.

Methods proposed by the Committee on Roofing Felt and Paperboard, for testing unimpregnated roofing felt, were also prepared in standard form for consideration by the committee. These, in addition to the ordinary strength, weight and thickness tests, include the kerosene test for saturating capacity, and the oil penetration tests and xylol test for rate of saturation.

The votes from the committee members so far received indicate that they favor the proposed revisions, therefore they will probably be submitted shortly for association action as to adoption.

Further progress in development work has proceeded slowly due to the necessity of reorganizing most of the sub-committees. Owing to the press of their other duties and other circumstances, three sub-committee chairmen resigned—Miss H. U. Kiely, chemical methods, Allen Abrams, water and grease resistance, and C. E. Libby, microscopical methods. P. F. Wehmer has succeeded Miss Kiely. This sub-committee has initiated work on determination of acidity of paper. The sub-committee on grease and water resistance has been divided into separate sub-committees for these two subjects. R. C. Griffin is in charge of grease resistance work, and water resistance has been taken over by P. W. Codwise. The main problems being considered in connection with determination of grease resistance are the development of a more accurate end-point and the finding of the most suitable oily or fatty material to use as the testing medium.

Some further progress has been made by the sub-committee on resistance of papers to printing inks. E. O. Reed, the chairman of this committee, informs me that the technical division of the Government Printing Office has made an extensive study of relation of oil absorption of news print to the porosity of the paper. The results so far obtained indicate that porosity may be used as a measurement of the ink resistance of such paper. The study is to be extended to other kinds of printing papers. This is an important development as porosity tests can be made much more simply and accurately than oil penetration tests.

It has not been possible as yet to find a successor to C. E. Libby for the further development of microscopical analysis. As pointed out at the last annual meeting, it is becoming increasingly difficult to find suitable men in the industry, who can find the time to direct the sub-committee development work. It is hoped that some means can be found by which this excellent work being done by the sub-committees can be supplemented by other development activities so as to give impetus to the development of needed methods. This is, without doubt, one of the most important ways in which the association can serve the industry.

### Alkaline Pulp Committee

E. S. Hinman of the P. H. Glatfelter Company, reported the activities of the new Alkaline Pulp Committee which is composed of the former two committees on soda pulp and sulphate pulp. A survey is being made of the methods used by manufacturers in handling wood from the pile or car to the digester and the advantages of weighing wood delivered to the digesters. Similar surveys are being made in the sulphate pulp industry of the methods of expressing sulphidity, reduction of sulphate, calculation of production, etc. The object of this is to put all sulphate mills on a common basis of expression of units.

Strength tests on soda and sulphate pulp in the various mills are being made using the same batch of pulp as a basis for method standardization. Questionnaires relating to the washing and bleaching of pulp are being handled under the TAPPI Service to Members Plan. All of these surveys are meeting with favorable attention by the industry and should result in summaries that will be of value to all the alkaline pulp mills in the industry.

In cooperation with the committee the Forest Products Laboratory is planning to study the problem of determining the critical temperature for cooking woods by the soda or sulphate processes

PICTURE TAKEN AT THE ANNUAL FALL MEETING OF THE TECHNICAL ASSOCIATION

which will produce pulps of required characteristics of strength and bleachability. The Forest Products Laboratory intends to work with longleaf pine and make a series of bomb scale cooks at definite causticity and sulphidity, varying the temperature and time of the cook. The small scale experiments will be repeated on increasingly larger amounts of wood until the full plant scale can be approximated.

The work of the Committee on Physical Standards for Pulp was outlined by D. E. Cable of the Oxford Paper Company who is chairman. This committee is carrying on one of the most important projects of interest to the industry today. This is the evaluation of the strength of pulp, a subject that is receiving thorough attention in every country engaged in the manufacture of pulp or paper. Dr. Cable's complete report will be published in the technical section of the PAPER TRADE JOURNAL.

G. K. Spence of the New York and Pennsylvania Company reported plans of the Stuff Preparation Committee to have a number of interesting papers presented at the annual meeting.

J. D. Miller of the York Haven Paper Company outlined the work of the Sub-Committee on Corrosion which is conducting a survey of this subject in sulphite mills and is also doing special work to study the resistance of alloys and metals to corrosion in sulphite digesters. Nearly all of the Technical Association Committees are arranging to have special programs during the annual meeting in the winter.

### Paper Making Patents

"What is Patentable in Paper Making" was the subject of an extremely interesting paper presented by C. W. Rivise of Philadelphia, Pa. As Mr. Rivise was formerly a patent examiner in the Patent Office he was able to point out the specific things looked for by examiners authorized to grant or reject patents. Many of the industry's most prominent inventors attended the meeting and entered the discussion which followed. Of particular interest to those who attended was the discussion of the legal features of patent applications and the interpretation of several patent case decisions such as those relating to the Eibel Process Company vs. Minnesota and Ontario Paper Company, American Sulphite Paper Company vs. Howland Falls Pulp Company, Paper and Textile Machinery Company vs. Downingtown Machine Company, etc. Mr. Rivise's paper was one of the longest ever presented before the Technical Association but the intense interest in the subject on the part of those who attended was reflected by the attention paid and the discussion that followed.

### Roll Winder Development

James A. Cameron, president of the Cameron Machine Company of Brooklyn, N. Y. read a paper indicating the basic principles of winding and cutting paper. A lively discussion followed during which E. W. G. Cooper of the Don Valley Paper Mills of Toronto, Ont., illustrated by means of a blackboard talk the solution of several winding problems. The consensus of opinion appeared to favor the location of the cutter as close to the rewinder as possible.

### Paper Board and Applied Mechanics

Clark C. Heritage of the Oxford Paper Company read a paper entitled The Measure of the Strength and Stiffness of Fiber Board by Means of Static Bending. In this paper Mr. Heritage and his

OF THE PULP AND PAPER INDUSTRY, RICHMOND, VA., SEPTEMBER 24-26, 1929

former associates at the Forest Products Laboratory make use of the principles involved in the preparation of a stress-strain diagram in much the same way as the metallurgical engineer measures these properties in a sample of steel. It is expected that further work along this line will demonstrate the adaptability of such testing methods to heavy sheets of paper.

### TAPPI—A.P.P.A. Fellowships

Prior to the meeting of TAPPI the advisory committee of the A.P.P.A. to the Forest Products Laboratory met and considered the merits of the joint fellowship at the laboratory. A resume of this meeting was given by R. H. Stevens of the Bogalusa Paper Company and by C. C. Heritage. Mr. Heritage pointed out that one of the most important things to be learned about a sheet of paper is the relation between the structural strength of the sheet and the proportion of solids by volume. Randal H. Doughty has been appointed to carry on the work at the laboratory. Following a complete analysis of the data available from previous work, experimental work will be carried on to study sheet strength on the load at which the sample breaks at rupture, the structural strength, the formation strength, and the fiber strength. It is not outside the realm of possibility to anticipate the time when the properties of a sheet of paper may be determined by tests on the pulp fibers in a suspension in water.

### The Paper Board Committee

The program of work of the three sub-committees on paper board was indicated by C. C. Heritage, chairman. One of the sub-committees is investigating the qualities of paper board and converted paper products and is classifying these qualities according to use and conversion requirements. Another sub-committee

B. K. STEADMAN, STANDARD PAPER MFG. CO.
**General Chairman of TAPPI Convention**

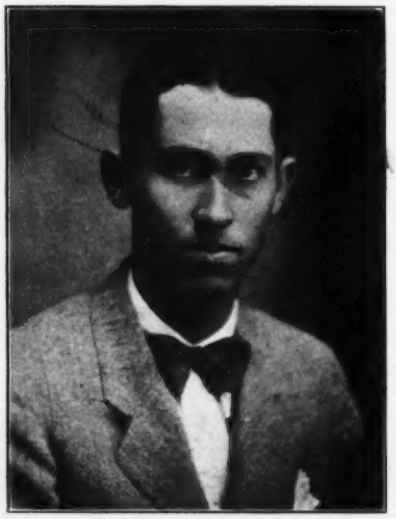
is studying cylinder machines and is paying particular attention to the machine variables. The third sub-committee is studying raw materials, particularly waste paper and considering improvements relative to their refinement and preparation for the paper machine.

### Visit to Richmond Mills

Tuesday afternoon was devoted to visits by the members to the mills of the Standard Paper Manufacturing Company, Albemarle Paper Manufacturing Company and the Manchester Paper Board Company, all of which are located in Richmond and produce the bulk of the blotting paper made in the United States as well as a part of the kraft and coated paper production. Of particular interest was the operation of the experimental paper machine at the Standard Paper Manufacturing Company plant which was producing a heavy sheet composed of pulp made from sugar cane refuse that had been made in the mill of Celulosa Cubana of Tuincucu, Cuba.

### Ladies Visit Historical Shrines

A special program was prepared for the ladies who attended the meeting. This consisted largely of sight seeing trips around Richmond and to the famous towns of Jamestown, Yorktown and Williamsburg. This section of Virginia is deeply steeped in the story of America's development. Jamestown was the first English settlement and is closely associated with the story of Capt. John Smith and Pocahontas. Yorktown saw the surrender of Lord Cornwallis to George Washington, and Williamsburg, a



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**Chairman Committee of Arrangements**

former Virginia capital, is the home of William and Mary College and the final resting place of General Lee. Richmond was the capital of the Confederacy as well as one of the cradles of the American revolution. Places of interest visited included Poe's home, Hollywood cemetery where Presidents Monroe, Tyler and Jefferson Davis are buried together with thousands of Civil War veterans.

In Washington the ladies were taken on bus trips to Alexandria, Mt. Vernon and to the United States government buildings.

### Banquets

On Tuesday evening a dinner was enjoyed at the Jefferson Hotel which was followed by dancing. In addition to a musical entertainment during the dinner an address was delivered by J. Fulmer Bright, mayor of Richmond, in which the members of the Technical Association were welcomed to Richmond and were told the interesting story of Richmond's history and industrial development, particularly as a paper making and tobacco center. President Glatfelter responded for the association. The toastmaster was James F. Ryland, vice president of the Standard Paper Manufacturing Company.

On Wednesday evening Mr. Ryland again ably presided as toastmaster at the annual Fall meeting banquet of TAPPI. Following a musical entertainment by the Standard orchestra, the Venetian Troubadours and the Sabbath Day Church choir of colored singers who featured the beautiful negro spiritual songs, the principal speaker was introduced. This was Col. Leroy Hodges, managing director of the state chamber of commerce of Virginia. Among other things Col. Hodges pointed out that the paper industry in Virginia is expanding at a rate nearly double that of the country as a whole.

To hasten the time when there will be an international acceptance of a method of evaluating wood pulp for strength the Tech-

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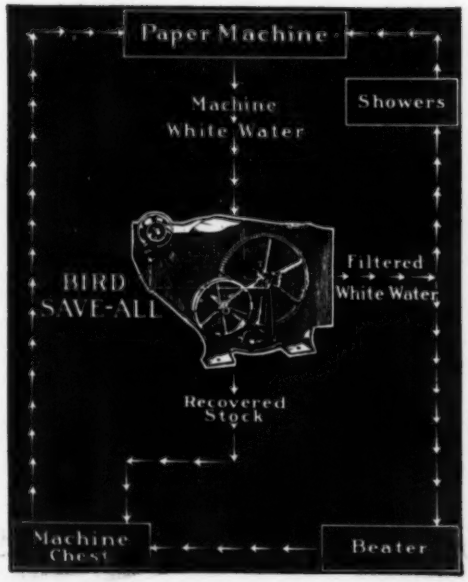


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nical Association committee on physical standards for pulp sponsored a symposium on this subject with D. E. Cable of the Oxford Paper Company as chairman.

Dr. Cable read a report outlining the program of work of his committee in which he indicated that a thorough review of the literature of pulp testing has been made by W. F. Moore of the U. S. Testing Company and was published recently in the PAPER TRADE JOURNAL. It is expected that as a result of the studies being made in this country and abroad there will be evolved two principal methods of testing pulp, one of which will involve considerable precision and will require special standard equipment and well defined procedure while the other will be suitable for mill control and will permit mills to use a variety of equipment to get a suitable valuation figure for the pulp as produced. The method will be relatively quick and will enable the operator to see how his pulp cooks are being carried out and to make the necessary corrections to meet operating conditions.

Austin Ely of Kimberly-Clark Corporation read a paper entitled "The Beater Method of Evaluating Pulp." Harry C. Bradford read a paper outlining the method adopted in the mills of the Kalamazoo Valley for testing pulp. The mills in this district manufacture no pulp but purchase it in large amounts. J. E. O'Connell of the Lake St. John Pulp and Paper Company of Dolbeau, P. Q., read a description of the procedure followed in his mill for estimating pulp strength. An interesting discussion of these papers followed dealing with details mentioned in the papers read which were quite similar in scope. Of particular interest to many was the question of the relationship between the laboratory tests and mill operation. For the most part it was found that mills are able to estimate this relationship quite closely. Mr. Ely stated that he found the one and one-half pound beater to give

O. L. SCHWEICKERT, BEDFORD PULP & PAPER CO.
**Chairman of Finance Committee**

the most satisfactory results and the best consistency to be one per cent.

C. P. Robinson of the Borregaard Company read a short paper relating to the commercial testing of pulp for moisture. He indicated that commercial pulp testers should be careful to sample pulp in such a way as to assure the obtaining of figures that will give a true measure of the dry pulp content of a shipment. When bales of pulp are allowed to remain in storage for a long time it is evident that the outside bales will assume a moisture content quite different to that of the bales inside of the pile. This is particularly true if the original shipment had a high moisture content. Only when the entire shipment is properly sampled can the figure obtained be considered fair to both the buyer and seller of pulp.

C. L. Wagner of the J. O. Ross Engineering Company gave a resume of previous papers relating to his furnace in a paper entitled "Modern Recovery in Sulphate and Soda Mills." This paper was made possible as a result of the successful operation of the Wagner Furnace in the mill of the Union Bag and Paper Power Company of Tacoma, Wash. Of special interest is the ability of this furnace to destroy the mercaptans and sulphide gases that are responsible for the odors characteristic of kraft pulp mills.

### Westinghouse Speed Regulator

R. R. Baker of the Westinghouse Electric and Manufacturing Company read a paper describing the new speed regulator de-

OLIN W. CALLIGHAN, EDGAR BROS. CO.
**Presented paper on Domestic Clays**

veloped by his company for use in the sectional paper machine drive. By use of this control each motor may be started, stopped or operated at low speed without interfering with the operation of the balance of the machine and does away with clutches and cone pulleys.

### Keasey TAPPI's Champion Golfer

As a result of the TAPPI golf tournament at the Country Club of Virginia it is doubtful if it will be necessary for the owners of the course to cut the grass for some time to come since this was taken care of by the entries in the tournament who were somewhat off form as a result of playing on a strange course. E. R. Neblett of the Standard Paper Manufacturing Company, a native of Richmond and one who is at home anywhere on the course demonstrated that nothing takes the place of experience and without much competition won the low net score prize. C. E. Curran of the Forest Products Laboratory won the blind bogey hands down and Horace Keasey, secretary of the Schmidt and Ault Paper Company from up York, Pennsylvania way took the native players into camp and won the low gross score and incidently the beautiful shield trophy presented by the D. J. Murray Manufacturing Company of Wausau, Wis.

### Paper Standards Symposium

Under the chairmanship of B. W. Scribner chief of the paper section of the U. S. Bureau of Standards a group of descriptive papers were presented relating to the program of work and equipment used at the Bureau. In opening the meeting Mr. Scribner outlined the various functions of the Bureau as a whole and indicated that the Paper Section frequently cooperated with other sections and obtained from them information that they were particularly competent to supply. The Bureau standardizes testing

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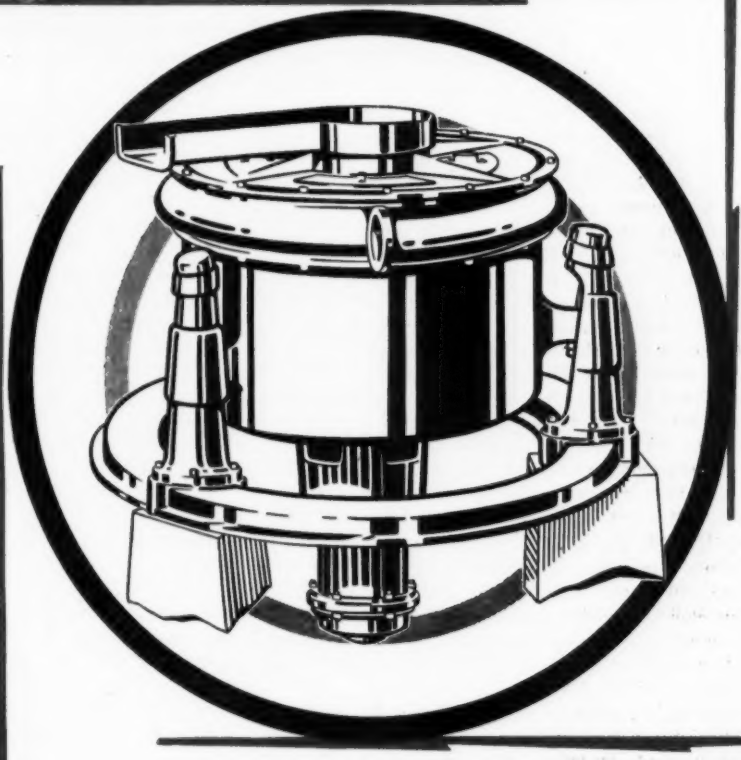

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instruments and is assisting in the standardization of paper quality specifications.

It keeps in close contact with the paper industry in several ways but particularly by cooperating with the Technical Association and by carrying on specific research into manufacturing methods.

F. T. Carson, associate scientist at the Bureau read a paper entitled "Paper Standards" and Merle B. Shaw, paper technologist read a paper entitled "Equipment and Researches of the Bureau of Standards Paper Mill." All of these papers will be published soon in the PAPER TRADE JOURNAL. As a result of this symposium the members were enabled to visit the Bureau in Washington with a clear understanding of its purpose and current projects.

### Shrinkage Symposium

Shrinkage, a subject of real timeliness was the feature covered by a group of papers presented on Thursday. Allen Abratus of the Marathon Paper Mills was introduced as chairman of the symposium by M. A. Krimmel, vice president of the Technical Association.

O. W. Callighan of Edgar Brothers Company presented a paper on "Recent Developments in Domestic Clays for Coating and Loading" in which he showed the advantages of domestic clays and gave the methods of clay testing that are recommended by the cerami industry. Among the advantages of domestic clays claimed by the author are greater covering power resulting in greater color efficiency, better coating finish due to the fineness and uniformity of the clay, greater paper opacity and better printability.

A. T. Taylor of the Bedford Pulp and Paper Company and R. H. Dines of the National Aluminate Corporation read papers entitled respectively "Shrinkage" and "Shrinkage Reduction"; Mr. Taylor pointed out that the causes for shrinkage in his mill were due to the large quantity of white water that went to the sewer, the excess of fresh water used on the machine, the inaccurate measurement of raw materials and the moisture loss in conversion from pulp to paper. Mr. Dines indicated that organic deterioration of cellulose fibers to slimes was an additional cause for shrinkage and showed how this loss was being minimized by chlorination and chemical treatment.

### Other Mill Visits

On Wednesday afternoon the members were taken in buses to Hopewell, Va., to visit the mill of the Hummel-Ross Fiber Corporation where the manufacture of sulphate pulp and kraft lines were being made. On Thursday a visit was made to the mill of the Chesapeake Corporation in West Point, Va. which is quite similar in many respects to the mill at Hopewell except for two additional features, namely the Kamys pulp drier which is the first to be installed in America and the building that is to house the machinery of the Albemarle-Chesapeake Corporation which will make kraft paper and board.

### Washington Meeting

After a night spent in the magnificent Wardman Park Hotel the TAPPI Washington headquarters buses took the members on a tour of inspection to the District of Columbia Paper Manufacturing Co.'s mill in Washington, D. C., the Bureau of Standards and the Government Printing Office. All of these institutions were well equipped with competent guides who pointed out the features of particular interest to the visitors. The D. of C. Paper Mfg. Co. is of particular interest inasmuch as it is located in the national capital which is quite free from industral plants. It manufactures soda pulp from pine obtained in nearby Virginia and Pennsylvania and half stuff from cotton linters grown in Virginia. This mill probably produces more grades of paper than any mill of its size in the world.

The Bureau of Standards had all of its machinery in operation and by means of display cards indicated the outstanding items of interest regarding the testing instruments on display. The Government Printing Office an immense industrial plant, the largest printing plant in the world, handling about 80,000 printing jobs annually demonstrated every detail of printing and book manufacture to the visitors. The well equipped laboratory under the direction of E. O. Reed tests over 8,000 samples of paper, glues, ink-making ingredients and miscellaneous materials each year.

### The Washington Committee

D. A. Smith of the District of Columbia Paper Mfg. Co. very kindly supplied the buses used in transporting the members in Washington. H. R. Harrigan of the same company was master of ceremonies and very capably handled the general program in Washington and was ably assisted by E. O. Reed and B. W. Scribner and other members of the committee including, G. W. Coggeshall, M. S. Kautrowitz, J. M. Krauss, M. B. Shaw, R. H. Simmons, O. G. Stricter, L. B. Tucker, C. J. West and A. D. White. While most of the Tappists visited the mill and government institutions many of the ladies were taken on a sight seeing trip around Washington and to Alexandria and Mt. Vernon as special guests of D. A. Smith.

### Those Who Attended

The following were among those who attended the meeting:

A. Aasen, Tronjheim, Norway. Mr. and Mrs. Allen Abrams, Marathon Paper Mills Co., Rothschild, Wis. Mr. and Mrs. W. H. Artz, Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa. A. E. Bachmann, Kimberly-Clark Co., Neenah, Wis. Mr. and Mrs. R. R. Baker, Westinghouse Elec. & Mfg. Co., Pittsburgh, Pa. M. D. Bardeen, Lee Paper Co., Vicksburg, Mich. R. C. Benner, Carborundum Co., Niagara Falls, N. Y. Th. C. Bentzen, Whiting-Plover Paper Co., Stevens Point, Wis. F. M. Beveridge, Hummel-Ross Paper Co., Hopewell, Va. G. W. Bicking, Bureau of Standards, Washington, D. C. Mr. and Mrs. Geo. L. Bidwell, Warren Mfg. Company, Milford, N. J. H. O. Bing, Paper & Textile Mach. Company, Sandusky, Ohio. C. F. Black, Fulton Engineering Co., Philadelphia, Pa. Philip S. Bolton, E. K. Mansfield Co., New York, N. Y. L. M. Booth, Booth Chemical Co., Elizabeth, N. J. Chas. W., Boyce, Amer. Paper & Pulp Ass'n., New York, N. Y. A. B. Bradley, Fibre Conduit Co., Orangeburg, N. Y. Linn Bradley, Bradley-McKeefe Corp., New York, N. Y. Mr. and Mrs. W. E. Brown, Pejepscot Paper Co., Brunswick, Me. C. J. Brooks, Starch Products Co., Brooklyn, N. Y. Mr. and Mrs. C. M. Bryan, Strathmore Paper Co., Woronoco, Mass. A. V. Burbage, Westinghouse Elec. & Mfg. Co., Richmond, Va. W. E. B. Baker, Stein-Hall Co., New York, N. Y. H. F. Brazeau, National Adhesives Co., New York, N. Y. H. C. Bradford, Rex Paper Co., Kalamazoo, Mich. W. H. Bradshaw, Du Pont Rayon Co., Buffalo, N. Y. Albert Ball, Carborundum Co., Niagara Falls, N. Y.

D. E. Cable, Oxford Paper Co., Brooklyn, N. Y. O. W. Callighan, Edgar Bros. Co., Metuchen, Pa. Mr. and Mrs. Jas. A. Cameron, Cameron Mach. Co., Brooklyn, N. Y. W. B. Campbell, Forest Products Lab. of Canada, Montreal. G. A. Carlton, Standard Paper Mfg. Co., Richmond, Va. F. T. Carson, Bureau of Standards, Washington, D. C. W. P. Carter, Standard Paper Mfg. Co., Richmond, Va. R. C. Charron, U. S. Envelope Co., Worcester, Mass. H. A. Chase, Brown Co., Burlin, N. H. A. B. Clark, Ross Eng. Co., New York, N. Y. F. C. Clark, South Manchester, Conn. J. B. Clarke, McDowell Paper Mills, Manayunk, Pa. Norman Clark, Standard Paper Mfg. Co., Richmond, Va. Mr. and Mrs. Max Cline, International Paper Co., Glens Falls, N. Y. Mr. and Mrs. B. W. Coale, Albemarle Paper Mfg. Co., Richmond, Va. A. E. Cofrin, Fort Howard Paper Co., Green Bay, Wis. C. M. Connor, Electro Bleaching Gas Co., Niagara Falls, N. Y. E. W. G. Cooper, Don Valley Paper Mills, Toronto, Ont. Canada. N. C. Cooper, Electro Bleaching Gas Co., New York, N. Y. Mr. and Mrs. John Cornell, The Paper Mill, New York, N. Y. O. C. Cordes, Westinghouse Elec. Mfg. Co., Richmond, Va. S. V. Cottrell, Nat'l Aniline & Chem. Co., Chicago, Ill. Mr. and Mrs. L. W. Crouse, Paper Makers Chemical Corp., Easton, Pa. Mr. and Mrs. Robt. Crump, Standard Paper Mfg. Co., Richmond, Va. Miss Emily Crump, Richmond, Va. Mr. and Mrs. C. E. Curran, U. S. Forest Products Lab., Madison, Wis.

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Complete description of our High Speed Beaters and standard Holland Beaters and Bandless Beater Rolls.

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V. P. Edwards, International Paper Co., New York, N. Y. Ivor Ekholm, Nat'l Aniline & Chem. Co., New York, N. Y. Mr. and Mrs. Austin Ely, Kimberly-Clark Corp., Neenah, Wis.

F. C. Farnsworth, Farnsworth Company Conshohocken, Pa. W. B. Ford, Amer. Glue Co., Boston, Mass. J. A. Foxgrover, Paper Makers Chem. Co., Kalamazoo, Mich. B. Fross, Skinner-Sherman & Esselen, Boston, Mass.

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T. H. Savery, Chicago, Ill.; R. H. Simmons, Government Printing Office, Washington, D. C.; B. S. Summers, Chicago, Ill.; J. Carl Schmidt, E. I. du Pont de Nemours, Philadelphia, Pa., M. Schuber, Champion Fibre Co., Canton, N. C.; H. C. Schwalbe, Dill & Collins Co., Philadelphia, Pa.; Mr. and Mrs. O. L. Schweickert, Bedford Pulp & Paper Co., Big Island, Va.; Mr. and Mrs. D. E. Scott, Adams Bag Co., Chagrin Falls, Ohio; B. W. Scribner, Bureau of Standards, Washington, D. C.; M. B. Shaw, Paper Sec. Bureau of Standards, Washington, D. C.; M. S. Schenk, National Adhesives Corp., New York, N. Y.; A. L. Sherwood, National Folding Box Co., New Haven, Conn.; J. C. Shuman, Nat. Aniline & Chem. Co., New York, N. Y.; Mr. and Mrs. H. Sinclair, Bennett Co., Inc., Cambridge, Mass.; C. L. Smith, Flintkote Co., Rutherford, N. J.; R. W. Smith, Bird Mach. Co., S. Walpole, Mass.; G. K. Spence, Castanea Paper Co., Johnsonburg, Pa.; H. S. Spencer, Howard Smith Paper Co.; Mr. and Mrs. B. F. Steadman, Standard Paper Co., Richmond Va.; R. H. Stevens, Bogalusa Paper Co., Bogalusa, La.; R. R. Stoltz, Westinghouse Elec. & Mfg. Co., Pittsburgh, Pa.; P. J. Sullivan, Continental Paper & Bag Co., New York, N. Y.; A. Suter, Bogalusa Paper Co., Bogalusa, La.; J. G. Sutton, Standard Paper Co., Richmond, Va.; C. R. Swett, Albemarle Paper Co., Richmond, Va.

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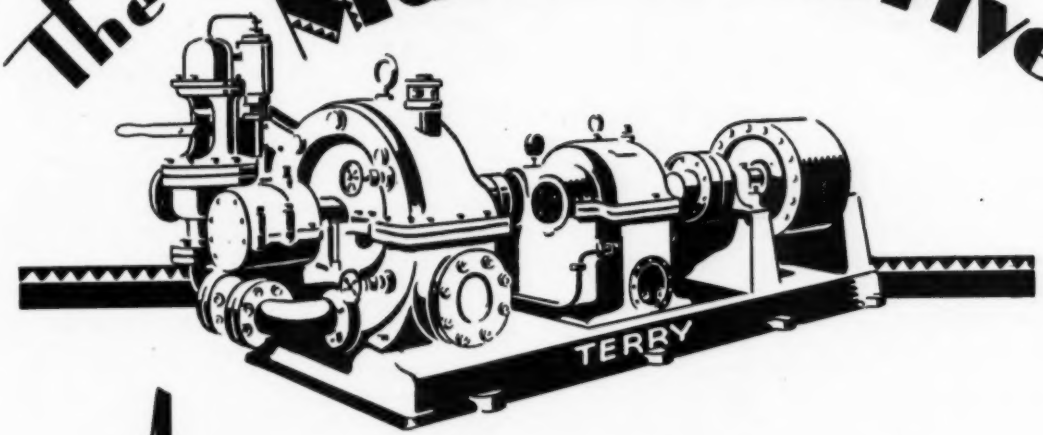
# The Terry Paper Machine Drive

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**The Terry drive permits the operation of a paper machine at any speed between specified limits. An increase or decrease in speed is made at a uniform rate. The speed range can be any value up to 10 to 1 or higher.**

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Mr. and Mrs. S. C. Zabriskie, S. C. Zabriskie Inc., New York, N. Y.

## Paper Mill to Benefit by New Freight Rates

WATERTOWN, N. Y., September 30, 1929—Paper manufacturers in this section will benefit considerably as the result of new rates recommended by the Interstate Commerce Commission included in the preliminary decision just handed down and which will also result in a big reduction in the freight rate costs of shipping southern clay from Georgia and South Carolina to all parts of New York State. Joseph A. Quinlan, who represented the St. Regis Paper Company, Taggart Brothers Corporation and Harrisville Paper Corporation, has received a communication from the commission including the reductions recommended.

The complaint was filed several months ago by these paper companies and a number of other concerns including the clay products. Other concerns filing objections were the International Paper Company, West Virginia Pulp and Paper Company, R. T. Vanderbilt Company, and Edgar Brothers. A large number of railroads were listed as defendants. According to the recommendation the Watertown rate which was $9.13 per ton when the case was started will be reduced to $6.70 per ton. This rate affects the entire Watertown group which includes mills at Deferiet, Black River, Felts Mills and Carthage. Some time after the case was first presented to the commission the carriers voluntarily reduced the rate to $8.28 a ton. Up to this time all mills have paid on a sectional basis but under the terms of the decision future rates will be fixed on a mileage basis.

Under the old schedule all mills in Northern New York paid the same rate of $9.13 per ton until the voluntary reduction to $8.28 by the railroads. This same rate applied to all parts of this section, the local mills paying the same rates as those in Glens Falls and other points which were more distant. In this case as in all others in which Mr. Quinlan appeared an attempt is made to place all Northern New York rates on a mileage basis. Under the proposed schedule for the southern clay Harrisville will pay $6.85 per ton and the mills at Norwood $7.10 a ton. All others in Northern New York will receive a reduction according to a mileage basis. The commission also recommended a drastic reduction in freight rates on imported clay which includes China clay. A large amount of the southern clay is used in paper manufacture and although the decision is not final the commission usually adopts the recommendations of the commissioner who studies the case, which is of vital importance to the entire industry.

## Big Power Development on Hudson

GLENS FALLS, N. Y., September 30, 1929—A power development on the Hudson River which will develop approximately 600,000,000 kilowatt hours of electricity is planned by the International Paper and Power Company in this section, according to A. R. Graustein, president of the firm. He said that he considered the development as a single unit but that as a matter of fact several plants along a series of waterfalls are contemplated. It is understood that the proposed development will take place along the river from Fort Edward to the confluence of the Hudson and Sacandaga Rivers near Luzerne.

With construction work on the mammoth Conklingville Reservoir nearing completion the New York Power and Light Corporation has announced plans for a $1,000,000 power project on the Upper Hudson at Spiers Falls. The plans call for construction of an additional unit to the plant there which now has a capacity of 30,000 horsepower. The additional unit will add 55,000 additional units to this capacity.

# Obituary

### James Rogers

[FROM OUR REGULAR CORRESPONDENT]

AU SABLE FORKS, N. Y., September 28.—James Rogers, 76 years old, pioneer paper manufacturer of Northern New York and president of the J. and J. Rogers Pulp and Paper Company, died at his home here on Tuesday, September 24, following a brief illness. His wife died exactly one week before which is believed to have affected him greatly and ultimately hastened his death.

Mr. Rogers was graduated from Cornell University in 1873 and embarked in business with his father at an early age. For many years they conducted an iron foundry business at this place prior to organizing the Rogers Pulp and Paper Company in 1888. Since that time he had devoted virtually his entire time to the affairs of the paper company and was largely instrumental for its rapid growth in recent years.

In the early experience of the Rogers Company in the pulp business they were greatly handicapped due to the fact that not only Mr. Rogers but his associates were determined to make it a local industry for the betterment of the people of Au Sable Forks and therefore sought to teach the men of "the old home town" the business of manufacturing the product for which the mill was erected. Local employes were given every opportunity to learn the business and were constantly encouraged to do so by the men whose money was invested in the project. The result has justified the efforts of the company, for the mill today has as competent a force as can be found in any mill in the country.

The pulp mill had not been long in operation before the results began to prove the sagacity of Mr. Rogers in inducing his friends to embark in the enterprise, and in 1903 the company expanded by the erection of the present paper mill. Although Mr. Rogers has gone to his eternal reward these mills will long stand as memorials to his business sagacity and interest in Au Sable Forks and its people.

Even before the erection of the paper mill, the company began expanding in a small way by the erection of the power plant at Black Brook in 1900; in 1905 the Keeseville power plant was installed and in 1907 the Au Sable village power plant was put in operation. In 1821 the Estes power plant was added to the company's list of holdings. In 1924 the company became the owners of the Northern Adirondack Power Company and in 1926 the Estes Rainbow plant was started.

The company also owns over ninety thousand acres of the finest spruce timber lands, much of which is of virgin timber, and to Mr. Rogers in no small degree belongs the credit of the growth and development of the company and the high standing it has acquired in not only the paper manufacturing world but in the general business world.

Mr. Rogers was also a director of the Robeson Process Company, Adirondack Corporation Ltd., Plattsburg National Bank and Trust Company, Champlain Valley Hospital and president of the Board of Education at Au Sable Forks. During the World War he was chairman of the Clinton County Red Cross, food administrator for Clinton County and chairman of the Liberty Loan and War Chest Drives. He is survived by one son, a daughter, a brother, a sister and several grandchildren.

## Olympic Forest Products Plan Pulp Mill

[FROM OUR REGULAR CORRESPONDENT]

PORT ANGELES, Wash., September 27, 1929.—Although no announcement has been made of the general contract for the construction of the proposed 500-ton pulp and timber mill for the Olympic Forest Products Company, a Zellerbach subsidiary, specifications are out for one 5,000 horse-power turbine to cost approximately $120,000. Work is now progressing on dismantling the war-time spruce mill which occupies the site selected for the pulp mill and officials of the company are said to be in Chicago completing arrangements for the project.

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ALPHA FIBRE requires no preparation for the beaters. It eliminates sorting, cleaning, washing, cooking and bleaching. Alpha cuts down the time element and attendant costs.

For the highest ranges of paper-making, Alpha Fibre offers an opportunity to produce papers that have been solely dependent upon cotton. Alpha cuts mill costs without loss of color-value or strength. It gives a tear test equal or superior to most rag-made papers and a texture as soft, opaque and velvety as desired.

The source of supply is stabilized and dependable. Use Alpha Fibre for quality papers.

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BROWN Company

FOUNDED 1852

Portland, Maine

# Big Canadian Paper and Pulp Merger Planned

## Acceptance of Offers by Shareholders Would Bring Under Unified Control Mills Operated by Canada Power & Paper Corp., Wayagamack Pulp & Paper Co., and Port Alfred Power & Paper Co.—Position of Each Company Would Be Strengthened Materially.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., October 1, 1929.—Negotiations in the long-talked-of merger of important pulp and paper companies with the Canada Power and Paper Corporation have at last come to a head. The directors of the Wayagamack Pulp and Paper Company and the Port Alfred Power and Paper Company have forwarded letters to their respective shareholders informing them of an offer made for the common shares, and recommending the acceptance of that offer.

Under the terms of the offer to shareholders of Wayagamack, they will receive for each of their present shares 1½ shares of Canada Power stock and $50 principal amount of Canada Powder debentures. The offer to Port Alfred common shareholders is 2¼ shares of Canada Power common stock for each share of Port Alfred common.

The acceptance of these offers by holders of a majority of the outstanding shares for which offers are being made will result in bringing under unified control and operation the mills operated by Canada Power and Paper Corporation at Grand'Mere, Shawinigan Falls and Cap de la Madeleine, by Wayagamack Pulp and Paper Company, at Three Rivers and by Port Alfred Pulp and Paper Corporation at Port Alfred, with a combined daily capacity for sale of paper and allied products in excess of 24,000 tons.

In the case of both the Wayagamack and the Port Alfred Companies, the directors express the opinion that by combining the operations of the properties of the three companies involved, the position of each will be materially strengthened.

### Adolph Ochs Discusses News Print

Adolph S. Ochs, owner of the *New York Times*, has been here during the past week on his way to Kapuskasing, Ont., to inspect the company's paper mills there. He was accompanied by Rollo Ogden, editor-in-chief of The Time, Milton Ochs, of Tennessee, Col. Julian Ochs, Theodore Palmer and several others.

In the course of an interview, Mr. Ochs expressed the opinion that the difficulties met with in Canada's news print industry would work themselves out if given sufficient time. He added: "Previously some of the producers took a narrow view of the industry. They ran prices up without regard to the future; they gave no thought to demand. They kept prices up artificially, and, as a natural consequence, there had to be an adjustment. These things generally right themselves if left to the general course of business."

Turning to the tariff question, Mr. Ochs thought that Canada had no need to feel apprehensive. "The United States' best customer is Canada," he said. "We need the Dominion's natural products. We are most intimate in our commercial, human, and social relations.

"Then you must remember that our president, Mr. Hoover, is a hardheaded business man. I do not think this tariff matter is one of serious concern to you. The tariff is always a local question, and each district views it from a different angle. There are so many conflicting interests that the question is always much aired everywhere," he concluded.

### Ground Wood Mill to be Dismantled

The Quebec Pulp and Paper Corporation is dismantling the ground wood mill at Val Jalbert, Que., which had a capacity of 125 tons per day, and which has been inoperative for some time. This has been decided on owing to the depressed state of the ground wood pulp market. The company has two other plants at Chicontimi, with a capacity of 200 tons per day, and these plants have continued operating.

Quebec Pulp and Paper Corporation is jointly controlled by Price Bros. and Port Alfred Pulp and Paper Company. There is, however, some $7,000,000 of preferred stock outstanding in the hands of the public. This stock is looked upon as having good possibilities, because the company has under its control timber limits, mostly freehold, estimated to contain some 5,000,000 cords of pulpwood, about 53,000 horsepower of hydro-electric energy, of which 36,000 h. p. is developed.

### Paper Company in Fight for Power

The Powell River Company, the leading news print manufacturers on the Pacific Coast, is engaged in a fight for power rights on the Lois River, its antagonist being the Consolidated Mining and Smelting Company, Canada's biggest mining corporation. Both have appeared before the British Columbia Water Board in the matter. Consolidated Smelters stated that they were prepared to build a smelter at Stillwater, B. C., if the power rights were granted. On the other hand, the general manager of the Powell River Company, A. E. McMaster, asserted that it would be necessary for his company to obtain the Lois River power if it intended to keep in step with demand for news print.

"If we get this power we will be able to go ahead with a program for greatly increasing the output of the Powell River Company. Expansion next year is justified by the increasing demand of our export markets. If we don't get this power we will be forced to let these export orders go elsewhere, for there is no other source of hydro-electric energy available."

Powell River Company put forward the claim that because it was an established industry near the Lois River site it should be given first consideration. J. J. Warren and other high officials of the Consolidated Mining & Smelting Company are expected to testify when the matter comes up for the main hearing next month.

### Mill Worker's Long Service Rewarded

[FROM OUR REGULAR CORRESPONDENT]

HOOSICK FALLS, N. Y., September 30, 1929.—Fifty years ago Richard H. Allen went to work at the age of fourteen in the North Hoosick plant of the Stevens & Thompson Paper Company as a helper on one of the big paper machines at a wage of seventy-five cents a day. At the end of three months with the firm he asked for a raise and he was advanced to one dollar a day. On his fiftieth anniversary he received a letter from the president of the firm congratulating him on his many years of service and expressing the appreciation of his loyalty during that long period. Accompanying the letter was a check for a substantial sum as another mark of appreciation from the company. For the past forty years Mr. Allen has been on the night shift working eleven hours. He is active in civic affairs and has also served a term as postmaster of this place. He has also served as a school trustee for the past twenty-five years besides taking a leading part in all educational affairs.

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### Wood Plant at Everett Nearly Complete

PORTLAND, Ore., September 30, 1929.—A chipping plant being built at Everett, Wash., by the International Wood and Sulphite company, to supply hog fuel and chipped wood for the Zellerbach mills on Puget Sound, is nearing completion. It is expected that it will be ready to start in October. It is on the site of the Canyon Lumber company's mill and is under contract to take all waste from the operation of that plant.

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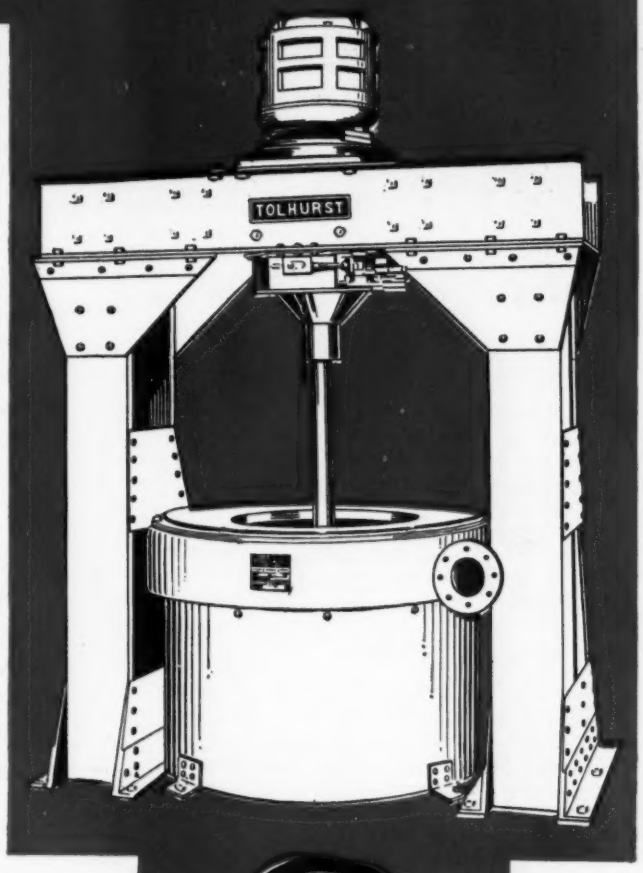
**The Tolhurst Centrifugal, exerting a force hundreds of times that of gravity is the answer to the demands for finer quality paper. It removes all foreign matter, from the minute specks of metal and grit, to the particles of rubber, cork, etc.**

**In addition to the thorough cleansing, the action within the machine produces these great advantages — 1, the fibre bundles are broken up; 2, a brushing out action that does not shorten the fibre takes place; 3, the resultant sheet is of better formation with higher pop and tear tests.**

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# Chicago Paper Market Exhibits Improvement

## Fine Paper Demand Strong Enough to Keep Manufacturers Busier Than For Some Time Past —Wrapping Paper Supplies Moving Into Consumption In Greater Volume—Paper Board Situation Takes Turn For Better—Book Paper Unchanged

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., September 30, 1929.—Conditions are reported favorable in the Chicago paper market and October gives every evidence of continuing the improvement noted in September. Prices are still said to be too low to permit any sort of unusual prosperity in the paper market but if demand keeps up paper representatives are going to be pleased, and will have the hope that improved conditions will eventually bring a bigger margin of profit.

News sprint continues to step forward with production reported all the way from five to ten per cent better than this time last year. The book market picked up this week though no change in prices was noted. The demand in fine papers is sufficiently strong to keep the mills busier than they have been for a long time and the same brisk condition prevails in the wrapping paper market. Board prices, long in the doldrums, are said to be taking a turn for the better.

### Bright Outlook for Paper Trade

Included in a number of comments on fall business prospects in Chicago appearing in the latest issue of the official publication of the Chicago Association of Commerce are three given by men in paper or allied lines. The comments so well reflect conditions here that they are given word for word. A. R. Martin of Bradner, Smith & Co., reports an unusually good volume of business thus far this year, even during the so-called slow months. He says "there should be a continuation of the satisfactory volume of business for the volume of the year. Collections continue to be somewhat slow but not to such an extent as to cause any uneasiness."

Another who finds the prospects bright, says the Chicago publication, is R. G. Fuller, agency sales manager of Tallman, Robbins & Co., loose leaf manufacturers. Mr. Fuller says, "In my opinion the outlook is about as bright as I have ever seen it. Chicago activities in various ways can mean nothing but a stupendous building program. In our business we have had a market improvement the first half of the year over any previous year and we look to a banner close for 1929."

The third of the group is James S. Cox, treasurer of W. C. Ritchie Company and president of the Chicago Association of Credit Men in 1927-28. Mr. Cox says of the paper box and fiber can industry here "I can see no danger signals as far as the first of January, 1930. The year up to the present has been quite satisfactory. There has been throughout the year considerable price competition which has, of course, made profits less substantial than last year. This, no doubt, will continue throughout the balance of the year. Volume, however, has shown improvement and there is every indication that this will continue. Such being the case we will be able to look back upon 1929 with satisfaction."

### Paper Merchants to Meet in Chicago

Although very little is known here of the detailed program of the National Paper Trade Association for its Fall meeting to be held at the Congress Hotel, October 7, 8 and 9, allied organizations have planned to make the occassion a memorable one for their own groups as well as for the association in general. Leo S. Altholz, president of the Chicago Paper Association, announces that his organization will maintain a suite of rooms at the Congress Hotel during the entire convention. Headquarters for the Chicago Paper Association will be in Room 1274. A cordial invitation has been extended to all members and guests at the National Paper Trade meeting to visit this suite of rooms. On account of this activity the regular meeting of the association scheduled for October 8 has been postponed until October 22 at which time a nominating committee will put up the slate of officers for the November election.

### Safety Congress Convenes

The Eighteenth Annual Safety Congress convenes in Chicago today, Monday, for a five day session at the Hotel Stevens, one of the largest hotels in the world. Chicago will play host to 7000 visitors during this important gathering. "Chicago Safety Week" will run concurrently with the big convention and already the loop district is placarded with posters relative to "Safety Week." Included in the many visitors to Chicago for the Congress will be representatives of a number of paper and pulp mills throughout the country. A section of the Congress organization is devoted to this class of industry and a representation of good size is assured. Methods used by the paper and pulp mills to promote and inspire safety measures in their factories will be illustrated and talked about at the Congress.

### News of the Trade

Listed among the papers reported this week as popular in Chicago printing and advertising firms are Marquette Enamel, made by the West Virginia Pulp and Paper Company; Lancaster Bond, made by the Gilbert Paper Company and distributed in Chicago by the Moser Paper Company, featured by 100 per cent rag content and with beauty of color and texture; Artesian Bond, made by Whiting-Plover Paper Company and distributed in Chicago by the Midland Paper Company, and Success Bond, manufactured by the Neenah Paper Company and distributed in Chicago by Midland. This group of papers has been well advertised throughout the past week and is getting splendid attention, according to reports.

Due to expansion of business, the Arthur R. Rapp Company have moved their offices and factory to 2323 Wolfram street, Chicago, Telephone, Brunswick 8822.

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## Awards Granted to Injured Mill Workers

[FROM OUR REGULAR CORRESPONDENT]

POTSDAM, N. Y., September 21, 1929.—A number of injured paper mill workers were granted awards during the past week at a hearing in compensation court before Referee James P. Richardson. The largest award made was granted to Fred Haverstock, of Watertown, an employe of the Bagley and Sewall Company, who when examined by a physician was found to have lost the use of his right arm. The award was for 109 weeks and amounts to approximately $2,184. He was injured on April 30 while working for the Bagley and Sewall Company. While sawing some timber he crushed a portion of his right hand and the condition is now permanent. His case was carried by the Utica Mutual Insurance Company.

Nick Phair, an employe of tha Dexter Sulphite, Paper and Pulp Company, was given an award of about $204.45, the rate being subject to change. He was injured in June when he was badly burned about the face and right arm while employed as a helper in the digester room. The referee ruled that there was no accident in the case of William Meduski, who claimed he was injured while digging a foundation for the new boiler house of the Bagley and Sewall Company at Watertown. He claimed injury to his shoulder but the referee explained there was no accident and that injury should occur instantly to warrant an award. Fred Hurd was awarded $159.99 for injuries received while working for Finch, Pruyn & Company, of Glens Falls, and Morris Ovitt was granted $112.88 as compensation for injuries received at the plant of the Imperial Color Works.

# M&W

## Brass Collapsible Drum Winder Shafts

NO ROLLS STUCK ON SHAFTS

Especially adapted for winding paper for plug cores of various diameters and widths

NO SPRINGS SMALL SCREWS OR RIVETS

**"M & W" BRASS COLLAPSIBLE SHAFTS**

are made of rugged construction and assure equal expansion at all times • • • Expansion or contraction is made in one operation by use of a wrench on the nut at end of shaft • • • These shafts can be used on all makes of drum winders; they can be used on any width or diameter of rolls and on any grade of paper or paper board when plugged rolls are required • • • The shaft contracts from 3/16" to 5/16" diameter (depending on shaft size) • • • With these shafts, rolls stuck on shaft are unknown, and it is never necessary to sledge or use pullers to remove shaft from rolls.

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THE MOORE & WHITE CO., NORTH PHILA. STATION PHILADELPHIA, PA.

PAPER · MACHINE · BUILDERS

# Activities of the Wisconsin Paper Industry

## Sawyer Paper Co., Wholesale Merchants, of Neenah, Plan Erection of New Concrete and Steel Building—Floor Area Will Contain Commodious Offices, Warehouse and Shipping Room—P. F. Neverman Addresses Pulp and Paper Mill Superintendents

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., September 30, 1929.—Improved quarters will be furnished the Sawyer Paper Company, wholesalers, of Neenah, Wis., through the erection of a new building. The size will be 40x75 feet, one story, with a 9-foot basement. Concrete and steel will be used. Growth of business made it necessary to provide added space, and the floor area will be double that of the former building. Commodious offices, warehouse and shipping room are included in the plans. The building will be ready for occupancy about January 1.

### Wage Rates in Wisconsin

Average wage rates in Wisconsin industries, among which are many paper mills, showed the lowest in July of this year for a period of five years. The per capita earning was $23.96, as compared to $24.24 in July of last year. The lowest point previously reached was $24.22 during the five year period. Working hours also have declined. The maximum record in September, 1928, was 51.8 hours per week. In July, 1929, it had dropped to 51.1 hours.

### P. C. Bradley Heads Superintendents

P. C. Bradley, superintendent of the Fort Howard Paper Company, Green Bay, Wis., is the new chairman of the Northwestern Division of the American Pulp and Paper Mill Superintendents Association. He was elected at the closing session of the annual Fall meeting last week at Marinette, Wis. First vice-chairman is James Simpson, of the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., and second vice-chairman is William Haddock, of the Escanaba Paper Company, Escanaba, Mich. Mr. Bradley will select his own secretary and treasurer and next convention city, which is expected to be Green Bay.

At the closing banquet, P. F. Neverman, secretary-manager of the Marinette Industrial Board, was the speaker. He showed how the paper industry has ascended from eighteenth to fourth place in the last forty years. Wisconsin has 105 plants, he said, employing 17,000 people, with an annual payroll of $21,000,000 and a total product value of $120,000,000.

Prizes in the golf tournament were awarded to James Simpson, Wisconsin Rapids; Frank Eilers, Piqua, Ohio; W. H. Sherman, Green Bay, and E. P. Gleason, Nekoosa, Wis.

### Cost Association Convention

An election for president will be conducted by mail among members of the Cost Association of the Paper Industry. This step was decided on at the annual convention at Wausau, Wis., last week because of the small number of members on hand the closing day. Ralph B Hersey, of Boston, Mass., and Henry R. Boston, North Hoosick, Mass., were nominated for the office. Thomas J. Burke, New York, continues as secretary-treasurer, an office he has held for nine years. One of the important speakers at the convention was Professor James L. Palmer, of the University of Chicago. He urged closer co-operation between the sales department and the accountants. Both departments contain qualities needed by the other for the best results in paper mill operation.

### Forestry Conference to be Held

Outstanding accomplishments in reforestation work of the Nekoosa-Edwards Paper Company, Port Edwards, Wis., will be the basis of a forestry and nursery conference to be held October 3 and 4 at Nekoosa, Wis., where the company's commercial forests are located. Governors of Wisconsin, Michigan and Minnesota, and Raphael Zon, managing director of the Great Lakes forestry experiment department, will be present. The U. S. Forestry Service, the University of Wisconsin, the Wisconsin Conservation Commission and the paper company are assisting in the program.

An inspection will be made of the 1,500-acre tract where the company has planted pine trees. The program of the company calls for planting 2,000 additional acres a year from a 3,000,000-tree nursery. Methods of extracting seeds from pine cones, the planting of the seeds, culture of seedlings and other processes will be demonstrated. It is believed that the value of commercial forestry can be shown more conclusively here than in any other way.

Study also will be given to forest fires and their prevention. Fires purposely will be set to demonstrate the handling of modern fire fighting equipment. One of the new forest fire trucks from Minnesota will be used. A demonstration also will be conducted of a new "brush breaker," tractor pulled, for use in clearing cut-over lands for tree planting.

There is considerable agitation for a vast reforestation program in the Great Lakes states. According to Joseph Kittredge, Jr., of the U. S. Forest Service, there are twenty million acres of forest lands in this area now unproductive, resulting in a loss to the region of some $20,000,000. He advocates a complete survey, fire protection and public planting.

### Consolidated Employes Benefit Association

Changes have been made in the membership requirements of the Employees Benefit Association of the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis. Hereafter no employee over 50 years of age will be eligible. The former age limit was 55. Six months of continuous employment will be the requisite hereafter instead of one year. Trustees elected for the fiscal year are: Otto Karloski and Robert Rogers, Wisconsin Rapids; Ray Aughey and John Abel, Biron; Ray Ritchay and Leo Gurney, Stevens Point; C. Day and H. Meinberg, Appleton, and Fred Knuth, of the Ahdawagam Paper Products Company, Wisconsin Rapids. Mr. Day is chairman of the board.

### Foremanship and Paper Testing Classes

Instruction in foremanship and paper testing is to be given employees of the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., in classes which have been organized for the Fall. All employees of the company's various mills are eligible to enroll. Instruction is furnished by the vocational school of Wisconsin Rapids, with arrangements so conducted that the men of each shift may participate.

### News of the Industry

Approximately 60,000 cords of pulpwood was rafted across Lake Superior this season by the Consolidated Water Power and Paper Company, of Wisconsin Rapids, Wis. The company's tug *Butterfield* has made regular trips all summer conveying the wood from the Canadian shores to Ashland, Wis., here it was reloaded for rail shipment to various mills. Crews are being organized now for the winter's cut of pulpwood.

John Stevens, Jr., has resigned his position with the Fox River Paper Company, Appleton, Wis., and has become affiliated with the Marathon Paper Mills Company, at its branch mill at Menasha, Wis. He probably will assume charge of production.

Signs 80 to 100 feet long and 5 to 8 feet high have been placed on the sides and roof of the DePere Paper Manufacturing Company, of DePere, Wis., as a means of helping the concern to advertise itself. The plant is located adjacent to heavily travelled motor highways.

# Get the facts

about

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**WITCO Paris Black**

# PAPER MILL EXECUTIVES

Paper mill executives place purchasing on a scientific basis. Quality is accurately estimated . . . economy allotted its full importance. So WITCO Blanc Fixe appeals to both the purchasing and production departments of progressive mills.

Blanc Fixe, as supplied by WITCO, equals the industry's highest specifications for quality. It stands for "known reliability" . . . for excellence which never varies.

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The position of WITCO as direct factors in the products we supply is a factor in thrifty buying. It is an advantage revealed by tangible, worth while savings.

WITCO Paris Black is also offered upon these terms . . . a product of tested excellence, giving satisfaction wherever quality is paramount.

Get WITCO quotations for prompt delivery of Blanc Fixe and Paris Black.

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# Paper Demand More Active In Philadelphia

## Distributors of Fine Paper Experience Excellent Request For Book Grades, Especially Unfinished—Some Improvement Noticed in Coarse Paper Market, With Krafts Moving in Good Volume—Trade Shows More Confidence, With Price Situation Steady to Firm.

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., September 30, 1929.—With the advancing business situation the paper market is keeping pace with the upward swing of commerce and industry. Both divisions of the paper trade have been more active and the general requirements of manufacturers, jobbers and merchants show increased consumption. There has been broader demand among the mill agents and those merchants who made bulk business their specialty. Wholesalers are making progress with volume shipments which are sold under contract. Fine paper wholesalers find the book grades most active and unfinished books the leaders. All lines of box making supplies show improvement but are not moving in the normal volume which is usually evident with the advent of autumn. The coarser grades of paper have been leading the way with better demand for krafts. Builders supplies are less active, as present construction needs wane. There has been more activity among the smaller mills in promoting production along the lines of specialties that ordinarily are given little attention by the more prominent manufacturers, and local distributors are cooperating in this phase of practice among the intermediate mills by concentration and research for new avenues for the absorption and sale of specialized grades of paper, containers, boards, wrappings and other straight papers or their allied converted products. As the autumn activity grows there is more confidence over the price situation, which just now is firm.

### Cotton Twines Discussed By Wholesale Merchants

Initiation of the Fall meetings of the Wholesale Paper and Cordage Association of Philadelphia was marked by an address on cotton twines given by Samuel N. Franks, Quaker City representative of the Bibbs Manufacturing Company, Macon, Ga. The first of the autumn sessions was held at the Adelphia Hotel, where the full quota of thirty members joined in a noon luncheon and then gave attention to the instructive and informative talk of Mr. Franks. He gave a detailed account of the manufacture of cotton twines, from the growing of cotton in the field to shipping and storing in the warehouse, explaining by samplers the various processes through which cotton passes, its grading and conversion into cords and twines. George K. Hooper, of the Hooper Paper and Twine Company, presided, and disclosed plans for the increase of membership. Secretary E. L. Richards announced that the organization had been incorporated this summer under the laws of Pennsylvania and that there was now enrolled in its ranks 90 per cent of the merchants in the wholesale paper and twine business in the Quaker City, or those with mills representation in its environs. The address on cotton twines was the first of a series of educational talks to be given this Fall and winter, with a view to establishing a better knowledge of the papers and cords handled by the various firms enrolled in the membership of the organization.

### Norristown Magnesia & Asbestos Co. Builds

The new addition to the warehouses of the Norristown Magnesia and Asbestos Company, of Norristown, Pa., is nearing completion and the recently constructed office building has been completed and is now occupied as executive headquarters. Following the completion of the buildings the firm is preparing to add materially to its paper machines, dryers, and other equipment, with a view to extending production to almost double present capacity. The installations will be made without interruption of operations as the manufacturers are well sold ahead on corrugated asbestos tubes which are now packed in a new style of packet and handy carton which may be stocked by the paper trade and others handling these lines. The new style packing developed by the Norristown company makes air cell coverings easier to handle. Being sealed in cartons, the covering stays cleaner and its average weight of 43 pounds is readily handled by the shipper. It is practically waterproof and provides for economy in transportation with a minimum of breakage. The carton of twenty tubes to the packet is easily inventoried, provides for economy of space and ready handling by the paper dealers. One of the innovations in the way of mechanical developments is the provision of units that will enable the firm to handle asbestos materials for paper making in an entirely new manner. The change will be a vast improvement in the present methods of paper making asbestos products. John M. High, sales manager of the company, who spent the summer touring the trade in the West, is back at his desk after making extensive business expansions in distribution along the Pacific Coast.

### Linear Packing Co. To Add To Buildings

Acquisition of 10,000 square feet of additional manufacturing space is announced by the Linear Packing Company, of this city, for the purpose of expansion of production of asbestos linings and packings made by the Quaker City manufacturers. The company will occupy a new mill on the site which was purchased on the main line of the New York Division of the Pennsylvania Railroad and the plaza of the new Tacony-Palmyra Bridge.

### Belmont Packing & Rubber Co. To Rebuild

Following the fire which recently destroyed its plant at Butler and Sepviva streets, the Belmont Packing and Rubber Company will rebuild its asbestos manufacturing structure this Fall. A contract for the erection of a four story plant has been awarded and building is now under way. The plans called for larger quarters constructed along the lines of modern, fireproof building which will enable the firm to develop its business.

### Keasby & Mattison's Sales Meetings

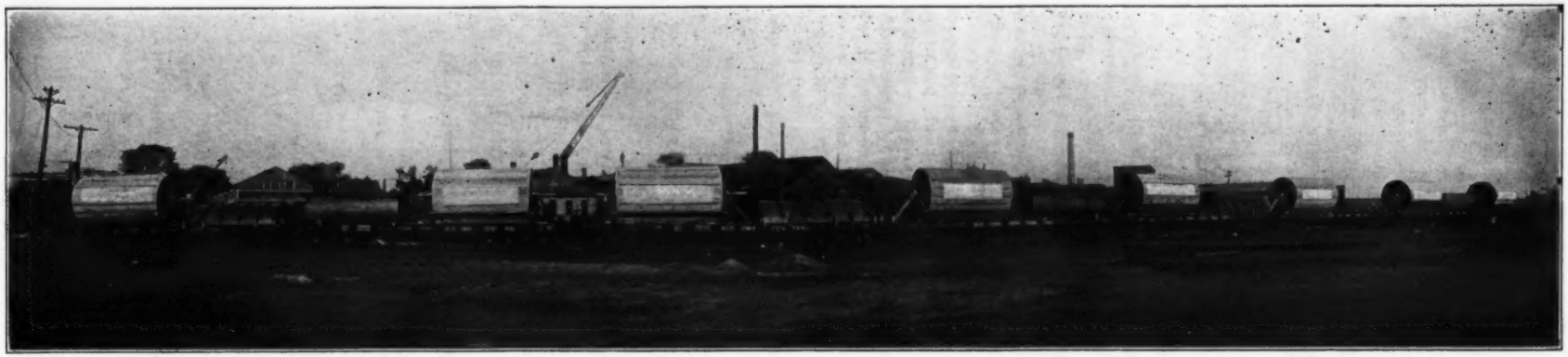
Throughout the summer months the Keasby and Mattison Company has been holding sales conferences and inspections of its plant for sales representatives from New York, Philadelphia, Baltimore, Boston, Cleveland, Chicago and Pittsburgh for the purpose of keeping the representatives informed on all innovations at its manufacturing plant at Ambler, Pa. Other sales representatives will spend the early autumn weeks in making the rounds of the plant and learning the newer asbestos manufacturing developments. Dr. Richard V. Mattison, head of the company, spent the late summer in Thetford, P. Q., Canada, inspecting the asbestos mines owned by the company. The firm is developing its brake linings and has been expanding this phase of its production lately. A new heavy duty brake lining was announced this summer.

### Other Asbestos Manufacturers Busy

Other noted asbestos manufacturing concerns linked with the trade are now enjoying full operation schedule as the season expansion in business requires broader operations. Among concerns in the local asbestos manufacturing business who are engaged on full time, with orders well sold ahead are: the Concentric Air-Cells Automatic, Inc., of 2122 South Darien street, Philadelphia; the Atlas Asbestos Company, North Wales, Pa., near Philadelphia, makers of asbestos joint runners; American Asbestos Company, Norristown, Pa., producers of asbestos textile and headquarters for yarns, cloth, tapes, fibres, brake linings, and other textiles; the Asbestos Fibre Spinning Company, North

October
Maschinenfabrik Imperial G.m.b.H. Meissen, Germany
SUMMER AVE. AND ERIE R. R. NEWARK, N. J.

# SHIPPING FILTERS BY THE TRAIN LOAD



*Part of Shipment to The Mersey Paper Co.*

**Shipment of Eight FEinc Filter DECKERS and Two FEinc Filter SAVE-ALLS to the Mersey Paper Company for their new plant at Liverpool, Nova Scotia. These filters were selected after careful consideration of all competitive machines and the decision based upon the fine showing of the FEinc Filters at the Soo Mill of The Spanish River Pulp and Paper Company, where FEinc Deckers have now been in operation for almost two years and are still doing good work with the original covering wire. The FEinc patented string discharge picks off thin or thick pads alike, always maintaining a clean filtering surface, constant flow and long life for covering wire.**

***Write for catalog "THE FILTER WITH THE STRINGS."***

**IN CANADA**
**Filtration Engineers Limited**
**Montreal, Que.**
**Sault Ste. Marie, Ont.**

**IN EUROPE**
**Maschinenfabrik Imperial**
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**Meissen, Germany**

**FILTRATION ENGINEERS INCORPORATED**
**SERVICE FE ECONOMY**
**GENERAL OFFICES AND PLANT**
**SUMMER AVE. AND ERIE R. R.**
**NEWARK, N. J.**

**Woolworth Building**
**New York, N. Y.**

**Buyers Building**
**Portland, Oregon**

**1135 Mission St.**
**San Francisco, Cal.**

Wales, Pa., braided tubings, packing, woven sheet asbestos papers, leggings, gaskets, rope, tapes and other products; H. F. Watson Company, of Erie, Pa., makers of asbestos roofings, and the Ehret Magnesia Manufacturing Company, of Valley Forge, Pa., makers of pipe and boiler coverings, felts and insulation requirements used by the building trades.

### Invents New Asbestos Cutting Machine

A. P. Jurgensen, who is president of the Concentric Aircells Automatic Inc., has invented a new automatic cutting machine which cuts and trims corrugated asbestos papers, automatically regulating the sizes desired. Layers of the paper are laid in the super-imposed arrangement in the machine and moulded in perfect concentric half sections. These sections are automatically ejected to an endless belt which carries the section through any dryer. It has an 80 per cent labor saving average and also effects economy in floor space because of its compactness, each unit requiring less than 100 square feet of floor space. The machines are now being sold to the asbestos paper converting industries.

### Paper Manufacturers Co. To Build

Now that ground has been broken by the Paper Manufacturers Company for an additional building to the present headquarters at 5th and Willow streets, plans for the erection of a building on the site are under way. The structure to be erected will correspond to the present building and will average the same area of space on the several floors that is included in the older building. The new quarters will shortly be started as ground clearing is nearing completion and will be used for warehousing and to take care of the increased business which this larger wrapping paper and specialty house conducts. It is expected to have the new structure ready for use by the first of the year.

### Buffalo Envelope Co.'s New List

The Buffalo Envelope Company, represented here by E. L. Richards, with offices in the Drexel Building, has just issued a new price list in the form of a handsome catalogue with Fabrikoid cover and in loose leaf form. It is compiled with a complete compendium of information on the various sizes carried and manufactured by the manufacturers. There is also a detailed information compendium on the sizes, grades, with classification of the various grades of papers used and with all die sizes of open faced envelopes and panels. The Buffalo Envelope Company has just marketed a new air mail envelope which meets the requirements of the Government and is of the standard used and approved by the Post Office Department and the Washington officials. The envelopes are packed in corrugated cartons which make them easier to handle and does away with the former bulkier wood containers. The new envelopes are being sold in the Philadelphia territory by Mr. Richards.

### Philadelphia Paper Trade Golf Outing

With a particularly enjoyable occasion in the records of the annual golfing tournaments, the members of the Philadelphia Paper Trade Golf Association met on the links of the Manufacturers Club at Oreland, Pa., last Tuesday and Wednesday and, after a lively contest on the green, gathered around the festive board and listened to their associates from out of town give hearty words of greeting and cheer that added zest to the banquet hour. There were 37 participants in the golfing meet and when, in the evening on Tuesday, all assembled at the dinner table, the party was swelled to 40 members with their guests from distant paper centers joining in the banquet. In the absence of Eugene Fry, of the Jessup and Moore Paper Company, who was scheduled to preside at the dinner session, Arthur B. Sherrill, of Reigel & Co., Inc., proved a worthy substitute who welcomed his fellows with brief and warm words and then introduced in his own genial way the speakers, Lou Calder, of New York; William Holden, of the New York offices of the George W. Millar Paper Company; Charles Hayes, of Kalamazoo, Mich., and Alexander Gilman, of the same city, who journeyed here particularly to join in the tournament. Each gave a terse but enjoyable talk in humorous vein that added to the spirit of good will and amity of the social gathering.

In the two days schedule allotted for the golfing matches there were played the qualifying rounds, the match play classes, and the final rounds for the championship, followed by the Kickers Handicap. This year's prizes were particularly valuable and worthy keepsakes of a memorable occasion in the chronicles of the Quaker City trade golfing tournaments. In the championship play the winner is entitled to hold the cup for the year and—if a winner for three consecutive years, the trophy remains in his possession. This year's victor in the Low Net was Harrison Baldwin of the Hammermill Paper Company, Erie, Pa., whose Gross was 91-handicap-12 and Net of 79. William Holden, of the George W. Millar Paper Company, New York, won the Kickers Handicap. Other winners were:— Geo. Stevens, Jessup & Moore Paper Company winner of 1st eight; William H. Anders, Perkins-Goodwin Company, winner of 2nd eight; Kendal Wyman, Falulah Paper Company, winner of 3rd eight; A. B. Sherrill, Riegel & Company, Inc., winner of 4th eight. Winners of defeated four of 1st eight—Roger B. Taft, Hammermill Paper Paper Company; winner of defeated four of 2nd eight—Thos. Ashworth, D. L. Ward Company; winner of defeated four 3rd eight—Willard Pringle, Seaman Paper Company; winner of defeated four of 4th eight, Merle S. Flint, Brown Company.

## Boston Paper Market Fairly Active

BOSTON, Mass., September 30, 1929.—September as a whole has been a busy month in the paper industry here, although some say the Fall business has not begun in as great a volume as was expected. In some quarters July and August were each productive of more orders than September. In some instances the amount of business coming in has been below normal. On the other hand several houses have been having a satisfactory weight of orders and dealers are generally cheerful. Prices remain at the same levels in both fine and coarse papers.

In th box board market it is whispered about that prices are going to advance, although they are not quoted higher hereabouts as yet, in spite of the fact that quotations have been marked up in some other parts of the country than New England. The amount of business is fair in some quarters. A dealer in one firm noted that business was picking up, but that with orders coming in no faster than they are, he could see no advantage in advancing prices. At the same time, it is reported that the candy box industry is prospering, calling for a big supply of containers. The shoe factories are also at least fairly busy, needing proportionate amounts of boxes, and of course raw material with which to make the containers. Filled news board is quotable in this market at $37.50 at $40 and chip board at $35 at $37.50.

The paper stock market has been steady for the most part. In some cases prices declined or advanced. Overissue news is quotable at .70 at .75, compared with a former range of .65 at .70. Foreign manila rope has been quoted as low as $4.00 and as high as 4.80. There has been less demand for domestic manila rope, which has been marked down to 4.25 from a previous price of 4.75.

## S. T. Baron Heads Paper Division

S. T. Baron, of the Royal Card and Paper Company, 216 Eleventh avenue, chairman of the Paper and Twine Division of the Business Men's Council of the Federation for the Support of Jewish Philanthropic Societies, announces that seventeen workers have accepted quotas of at least ten new members each in the impending membership campaign to widen the support of the local Jewish charities.

The campaign in the paper and twine division will be conducted in conjunction with the city-wide membership drive to be carried on by the Federation, an affiliation of ninety-one of the leading philanthropic and communal agencies serving the Jewish population of New York.

# CLEANER STOCK– QUICKER–and CHEAPER

**More and more mills are appreciating the quick screening advantages of the Inclined Screen. But *only* the Harmon Inclined Screen—made exclusively by Bagley & Sewall—includes this feature as a construction detail. Far different, in performance, maintenance and low power costs, than an up-ended flat screen. Piston shafts remain perpendicular, giving positive, straight-forward action. Special type cams, with individual vacuum chambers, give a sharp, slot-cleaning blast and a slower, stock-drawing suction. Non-clogging plates give increased capacity, permitting use of finer screens. Shower piping and pumping expense are eliminated. Actual experience proves that the Harmon Screen will pass more stock, cleaner and cheaper, than any other diaphragm screen built.**

**There's more we'd like to tell you. Write us.**

## The Bagley & Sewall Co.

**Watertown. N.Y.**

# Bush Fire Hazard Becomes Normal in Ontario

## Considerable Improvement Effected in Situation, Due to Cold Weather and Snow in North and Rain in South Eastern Section of Province—New Toronto Plant of Canadian Paperboard Co., Ltd., Is Proving Exceptionally Efficient and Very Economical

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., September 30, 1929—With cold weather and snow in the north and rain in the south eastern section of the province, the bush fire hazard has returned to normal after considerable damage to pulpwood in Ontario, the Hon. William Fanlayson, Minister of Lands and Forests, reported this week. The only place in the province where the haze remains high is the Red Lake district where seven large fires are still burning. No rain has fallen in this territory and the fires, believed to have come from Manitoba, are burning on. There have been fifty fires in the Tweed district in the southeastern part of the province in the past few weeks but each has been brought under control in 24 hours, Mr. Finlayson said. The fire loss, he added, was small, considering the high hazard. In the main the fire burned over brush and scattered stands of spruce and poplar. In this section of the province the fire crews, which sometimes numbered as high as 200 men, found it to their interest to assist in the extinguishing of the fires in organized townships, even though this did not come within their duties. This was done, however, to prevent blazes spreading from the townships to the Crown lands, care of which is the rangers' charge.

### Canadian Paperboard Business Good

Operations of the new plant of Canadian Paperboard Company, Ltd., at Toronto have been meeting with gratifying success, according to reports of directors and management. The unit, which was only put up this year on the water front, is proving a very efficient and economical one, and the additional production which it has made available to the organization is being fully availed of. It is understood that the company, during the present year, is operating on a still more satisfactory basis than last year. Marketing conditions for the products which it manufactures have become more stabilized, and this is permitting an improvement in the situation generally as affecting the organization and others active in similar lines of production. The new plant at Toronto has been designed for the manufacture of paperboard. This is in addition to the company's other plants producing paperboard and ground wood pulp, located at Montreal, Que., and Frankford and Campbellford, Ont. Through its subsidiary, the Qunite and Trent Valley Power Company, the organization owns valuable water rights and developed power.

### Good Showing of Canadian Wirebound

A balance sheet covering the first four months' operations of the current fiscal year, reveals a very strong position to the credit of Canadian Wirebound Boxes, Ltd., Toronto and Montreal, large manufacturers of paper boxes as well as wirebound containers. Current assets totalled $920,535.52, against current liabilities of $35,640.43, showing a ratio of almost II to I, which compared to 9 to 1 on April 30, 1929, the end of the fiscal year. The net working capital position stands at $834,895.09, of which $477,376.03 is in cash or in call loans. The net profits during the four months just ended were $92,066.22 as against $90,744.88 for the same four months last year. These figures are after absorbing all losses and expenses incidental to establishing the Corrugated Box Division. The showing is considered very satisfactory as during the period which is perhaps the quietest during the year the company took possession of the Thompson Norris plant in Toronto immediately to the west of the main plant and rearranged the entire system of processing as well as the instalment of new machines. This work was done without suspending plant operations. Both these plants are now merged into one continuous sequence of operations giving much greater efficiency and capacity to cope with the continuous growth of business in the Toronto territory.

### Government to Revise Wall Paper Tariff

Inquiries authorized by the Hon. James A. Robb, Minister of Finance at Ottawa, into various phases of the glass, wall paper and linoleum industries, offer further evidence that the mind of the Government and the efforts of the Advisory Board on Tariff and Taxation are concentrated on the idea of building up Canadian industry and trading with those countries which are willing to trade with Canada. It is pointed out that United States products are finding a market in Canada in spite of substantial tariff protection, and it is for the Board and the Government to determine what readjustments can be made to achieve the desired end. Total production of all paper in Canada last year was about $3,000,000 and total imports $601,127, of which $129,730 came from the United Kingdom and $439,312 from the United States. The present duties are 22½ per cent. British preference, 32½ per cent. intermediate, and 35 per cent. general.

### Paper Men in Train Wreck

C. Howard Smith, president, and Harold Crabtree, vice-president, of the Howard Smith Paper Mills, while enroute to Toronto from Montreal this week were shaken up in a collision between two C. N. R. trains near Kingston, Ont., when a number of passengers were badly injured but none killed. Mr. Smith and Mr. Crabtree were in their berths at the time of the crash and both were thrown out into the train aisle. From a comfortable chair in the National Club in Toronto Mr. Smith said: "I'll tell you what a train wreck feels like. It feels as if you were standing on the edge of a precipice and someone hit you a crack on the jaw and knocked you over. The next thing you know is the bump when you hit the bottom. It was just jar, bump, bump, bump, bang. And the splinters looked like the realest wreck you ever saw. We must have plowed more than a thousand feet through the other train and if it hadn't been steel construction there would have been nothing left but kindling wood."

### No Help for Manitoba Paper

The settlement of the natural resources controversy in regard to Manitoba would appear to be exerting an unfavorable influence upon the treatment being accorded the Manitoba Paper Company in the matter of pulpwood reserves. The company in 1927 issued bonds to provide a mill with a productive capacity of 250 tons of news print per day and did so upon the explicit understanding that the Dominion Government would ensure to it a wood supply equivalent to 6,000,000 cords. The mill was constructed and the Dominion Government set aside a large area in the middle north of the province from which pulpwood areas were to be selected for the company. These selections were to proceed until the 6,000,000 cords were obtained, when the remaining parts of the area were to be released for commercial exploitation by other companies. In the intervening two years the timber cruisers of the company and the Government have gone over this area and it is now announced that the entire area set aside in 1927 only holds 2,516,243 cords of pulpwood. The company has asked the Government to take the necessary action to increase the reserve supplies of wood and while the Dominion Government is willing to do this, the Provincial Government appears to delay the final settlement until the control of these resources has passed definitely out of the hands of the Dominion and into the hands of the Provincial

# ENGLISH CHINA CLAY

*Agents for*

## PEERLESS WHITE LIME

***The Highest Calcium Oxide (CaO) Lime Produced***

## TISSUE FILLER

***For Whitest Color & Best Finish***

## A. M. MEINCKE & SON

*Materials for Paper Making*

**7 South Dearborn St.,**
**Chicago, Ill.**

Government. An agreement in this regard has been arrived at and the necessary legislation to effect the transfer will be put through at the next session of Parliament. If the Provincial Government insists upon delay, and it seems probable that it will, then the paper company will have to wait for at least one year for action, and in the meantime other private companies are becoming interested in news print development—such as the British syndicate which holds a priority permit for White Mud Falls on the Nelson River—and it may become increasingly difficult to do justice to the needs of the original company. The Dominion Government not only has suggested to the province that immediate steps be taken to augment the supplies of the Manitoba Paper Company, but has set out definitely how this may be accomplished without injuring any other news print mill site within the province. As yet the province has declined to co-operate in the matter.

### General News of the Industry

P. N. Fox has resigned from the St. Lawrence Paper Company to accept the position of assistant to the president of the Lake St. John Pulp and Paper Company. The head office is being removed from Montreal to Dolbeau, Que. Mr. Fox has been assistant manager at the St. Lawrence mill at Three Rivers.

The Sydney Roofing and Paper Company, Ltd., of Vancouver and Victoria, B. C., had a large exhibit of Thermogen Mulch paper at the 60th annual Provincial Exhibition at New Westminster, B. C., recently. The firm showed plants, both flowers and vegetables, actually growing in beds topped with this mulch paper, and samples of the product were also displayed. The background was provided by a massed display of mulch paper and other products of the firm.

The old Ritchie & Ramsay coated paper mill at New Toronto has ceased operations as the result of the merging of the company in the Reliance Paper Mills which took over the New Toronto plant. Many of the hands were moved to the Georgetown plant and others found employment in other paper mills and warehouses in the city and district. Harry Ramsay, the mill manager, is now at the head office of Reliance in Toronto. There is still a small stock of paper at the New Toronto mill and this is being sold, together with the property, as bids come in.

George C. Winlow, of the Reliance Paper Mills, Bay street, Toronto, has gone on a business trip to the Pacific Coast.

Notices have gone out to the bowlers in the paper box industry calling for the opening of the Toronto Carton Club's annual bowling tournament to open on October 1. A. G. Allen, of Paper Sales, Ltd., is again secretary and already considerable interest is being manifested in the event. Some valuable prizes are being offered.

The staff of the C. V. Syrett Paper Company, Ltd., Front street, Toronto, drove to Peterborough, Ont., a few days ago, where they were the guests of the Canadian Nashua and Canadian Sealwax, for which the Toronto firm are the selling agents. Taken in hand by John Marshall, the manager, and other executives the Toronto visitors were shown through the plant where the various processes employed by Nashua and Sealwax in their manufacturing operations were explained. The visitors were entertained at the hotel while in Peterborough and also shown about the city.

Exterior alterations are to be made to the three-story building at 255 Wellington street, West, Toronto, recently acquired by Buscombe & Dodds, Ltd., waste paper dealers. Robert J. Espe, president of the Espe Printing Company, Toronto, is head of Buscombe & Dodds.

Interlake Tissue Mills, Ltd., with mill at Thorold, Ont., and head office at Toronto, held its quarterly meeting in Toronto this week and passed the quarterly dividend. The company reports business in light weight papers as being satisfactory. Their new addition put up within the past few months is now in use and has added extensive manufacturing facilities to the already well equipped plant.

A number of the members of the wholesale paper trade in Toronto were present at the monthly dinner meeting of the Toronto Club of Printing House Craftsmen at the Royal York Hotel, Toronto, on September 25, when the club was addressed by Walter Smith on "The evolution of the Printing Press Within the Past Ten Years." Charles Conquergood, of the Canada Printing Ink Company, spoke on some high lights of the recent Craftsmen's convention in Toronto.

## Studies Fiber Wall Boards

WASHINGTON, D. C., September 18, 1929.—The Bureau of Standards has completed an investigation to assist in the formulation of purchase specifications for fiber wall board. Manufacturers, builders, and various government interests cooperated in the study. In view of the steadily increasing use of fiber wall boards for all types of buildings, this work is of considerable general interest.

It was concluded that moisture resistance and strength are the qualities of prime importance. A high degree of moisture resistance is necessary for protection against warping and deterioration caused by dampness. Rosin sizing distributed throughout the boards is considered necessary for adequate moisture resistance. A means of measuring the expansion of boards subjected to a moisture-saturated atmosphere was developed, as warping is the result of excessive expansion which sometimes occurs when moisture is absorbed. The boards must have sufficient strength to withstand the handling incident to construction work.

In preparing its report on this work, use was made of a previous research conducted by the bureau during the World War to assist the War Department in obtaining satisfactory boards for an immense number of temporary military structures. That pioneer research gave considerable impetus to general improvement in the quality of fiber wall boards and it served as a starting point for the further research.

## Paper Salesmen Hold Golf Outing

The New York Division of the Salesmen's Association of the Paper Industry held its annual September golf outing at Leewood Golf Club on Tuesday, September 17. In spite of the heavy rain which fell at times during the day, sixteen members and guests played the eighteen holes and some very respectable scores were turned in.

Of the local prizes, that for low gross score was won by James J. Lee, of the James J. Lee Paper Company; that for low net by H. M. Early, of International Paper Company; and the prize for the best net score on either nine was won by T. K. Davis, of International Paper Company.

Team and individual scores in competition for the Harbison Trophy, the *American Paper Merchant's* Prize, and the President's Trophy will be turned over to R. D. W. Ewing, of the American Writing Paper Company, national chairman of the association's golf committee, for presentation at the Association luncheon in Chicago, on Tuesday, October 8. At this time the name of the division winning the Harbison Trophy will be announced and also the names of the winners of the individual prizes put up for national competition among the members of the Salesmen's Association.

## Paper Technologist Club Meets

KALAMAZOO, Mich., September 16, 1929.—The Paper Technologist Club of Kalamazoo had a very profitable and interesting meeting on Wednesday, September 11 at the cottage of Frank Wittington. A report was given on work done to standardize rosin size analysis.

A paper was read by Carl C. Schneider, "The Value of Rags." The handling of materials was discussed from all angles as receiving, storing of same and so on.

The meeting was interesting which was evidenced by the late hour at which it was adjourned.

*Beater*
*Sheet Mould*
*Hydraulic Press*
*Hot Plate*

*Couch Roll*
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*Size Tester*
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# *The* Point that EVERY MILL *is coming to!*

THE time is not far off when practically every mill in the paper industry will enjoy the advantages of its own testing laboratory.

The steady progress and development that is being advanced by the leading mills of the industry is too great a pace for any mill to maintain through methods of guesswork and ordinary mill experience.

Valley Laboratory Equipment offers any mill a two-fold advantage: (1) *research and experimentation,* (2) *daily production control.*

Quality of dependable uniformity is always assured when pulp is constantly undergoing a process of careful checking and analysis. Quality is uniform on repeat runs.

*May we send you a copy of our new Laboratory Booklet? It will come to you by making request to the Valley Iron Works Co., Appleton, Wisconsin.*

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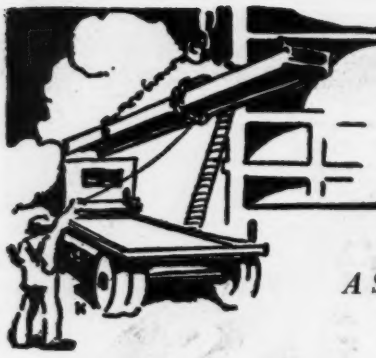


# CONSTRUCTION NEWS

*A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills*

## Construction News

**Cincinnati, Ohio**—The Western Paper Goods Company, 1224 West Eighth street, is said to be planning the construction of a new plant on site selected on the Bond Hill Paddock Road, fronting on the line of the Baltimore & Ohio Railroad, reported to cost more than $200,000, with equipment. It is understood that an architect will be selected to prepare plans at an early date. F. H. Herold is president.

**Garden City, N. Y.**—The A. E. MacAdams Company, 97 Lexington avenue, Brooklyn, N. Y., manufacturer of paper goods, has approved plans for a new one-story plant at Garden City, portion of structure to be used for storage and distributing service. It is estimated to cost close to $45,000, with equipment. General building contract has been let to the H. D. Best Company, 419 Fourth avenue, New York.

**Everett, Wash.**—The Puget Sound Pulp and Timber Company, Medical and Dental Building, Everett, has approved plans for different units of its proposed new local pulp mill, and will proceed with superstructure at an early date. The different buildings will include a one-story drying and machine unit, 86x235 feet; pulp storage and shipping buildings, two, each 78x200 feet; one-story burner unit, 45x75 feet; settling tank and cooler room, 40x75 feet; one-story digester building, with space for handling five units, 40x130 feet; one-story stores and shop building, 48x54 feet; forge and blacksmith shop, 50x90 feet; meter house; unit for four acid storage tanks; blow pit building, with five blow pits, each 85x120 feet, and two miscellaneous units, 86x235 feet, and 45x45 feet, with general office building, 50x85 feet. A bulkhead and dock will also be built, and contract for the latter has been let to the Puget Sound Bridge and Dredging Company, Central Building, Seattle, Wash. The entire project will cost close to $2,500,000, with equipment.

**Greenville, Miss.**—The Chicago Mill and Lumber Corporation, 111 West Washington street, Chicago, Ill., has plans for a one-story steam power house at its new insulating board mill at Greenville, to be one-story, 49x58 feet, with one-story fuel room adjoining, 34x58 feet, reported to cost close to $35,000, with equipment. Work will be placed under way at an early date. H. W. Lathrop is company architect.

**Anniston, Ala.**—The Anniston Box Company, Anniston, manufacturer of paper boxes and containers, etc., is said to be planning an expansion program at its plant to provide for considerable increase in present output. Additional equipment will be installed. Estimates of cost are being made.

**Attleboro, Mass.**—The American Reinforced Paper Company, Starkey avenue, has awarded a general contract to C. K. Rathbone, Hospital Trust Building, Providence, R. I., for proposed new addition to mill, and will begin foundations at once. The unit will be one-story, brick and steel, 46x175 feet, estimated to cost about $45,000, with equipment. Portion of structure will be devoted to storage and distributing service. Charles T. Main, 201 Devonshire street, Boston, Mass., is architect and engineer.

**Holyoke, Mass.**—The National Blank Book Company has filed plans for immediate erection of proposed new mill unit at Riverside, to be five-story, 60x150 feet, brick and steel, reported to cost close to $100,000, with equipment. General contract was recently let to the Casper Ranger Construction Company, 20 Bond street, Holyoke.

**Baltimore, Md.**—The Chesapeake Paper Board Company, Key highway and the Baltimore & Ohio Railroad, is making improvements in power department, and has awarded a contract to the Rust Engineering Company, 606 Grant street, Pittsburgh, Pa., for a reinforced-concrete smoke stack, reported to cost about $14,000. Carl R. Lefren is company architect.

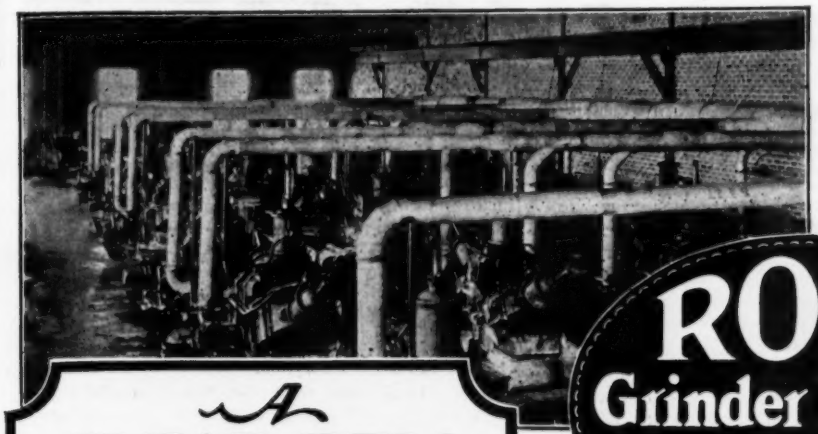
**Buffalo, N. Y.**—The Victor Box & Mills Company, 62 Leslie street, manufacturer of paper boxes and containers, has taken out a building permit for a new one-story plant unit at 146-50 West Shore avenue, reported to cost about $20,000, with equipment. Superstructure will be placed under way at once.

**Port Angeles, Wash.**—The Olympic Forest Products Company, Port Angeles, is perfecting plans for the construction of its proposed new pulp mill on local site, to be equipped for a capacity of 500 tons per day. Specifications are out for a 5,000 hp. turbine unit for power service at the mill, with auxiliary power equipment reported to cost about $120,000. Other equipment will be purchased at an early date. The entire project is reported to cost in excess of $1,200,000. A spruce mill now on the site, which has been inactive for several years, is being dismantled.

**New York, N. Y.**—The American Bread Wrapper Company, 361 East Ohio street, Chicago, Ill., manufacturer of paper wrappers for bread and other similar food products, has leased space in the new terminal building of the Lehigh Valley Railroad in the Bronx, and will occupy for an eastern manufacturing and distributing plant. Equipment will be installed at an early date. This is the first plant in the east to be established by the company.

**Philadelphia, Pa.**—The new plant unit of the Paper Manufacturers Company, Inc., Fifth and Willow streets, to be located at 507 Callowhill street, referred to in these columns last week, will be of larger size than noted, and will represent an investment of about $50,000, with equipment, instead of a smaller sum previously stated. General contract has been let to Edwin E. Hollenback, Inc., 1910 North Marshall street, and superstructure will be placed under way at once. Clarence E. Wunder, 1520 Locust street, Philadelphia, is architect and engineer.

**Benton Harbor, Mich.**—The Bonnar-Vawter Fanform Company has been organized with a capital of $750,000 and 10,000 shares of common stock, no par value, to take over and consolidate the Vawter Manifold Company, Benton Harbor, and the American Fanform Company, 2570 Superior avenue, Cleveland, Ohio, both manufacturers of commercial paper stocks used for billing and kindred service on calculating machines. The consolidated organization is said to be planning to maintain both plants in service as heretofore, and will carry out an expansion program for increased capacity. William A. Vawter, formerly president of the Baker-Vawter Company, Benton Harbor, sold about two years ago to Remington-Rand, Inc., New York, and now head



A CLEAR DRY GRINDER ROOM

ROSS Grinder Exhaust SYSTEMS

*Write for copy of our latest Bulletin No. 14 on this system.*

**Executives of mills that have installed the Ross Grinder Exhaust System are enthusiastic about its performance. On the Pacific Coast—throughout the East—in the United States and Canada—the thick, troublesome fog in grinder rooms is being completely eliminated, atmosphere cleared, working conditions tremendously improved. A number of prominent mills are operating the Ross Exhaust System in conjunction with the Briner Economizer. These mills not only eliminate the waste vapor but in addition utilize it for heating purposes—thus greatly reducing their steam costs.**

Ross-Briner Economizer; Ross-Grewin High Pressure Machine Ventilating System; Ross-Baxter Grinder Exhaust System; Ross Vapor Absorption System; Ross-Wagner Recovery System; Ross Systems for Machine Rooms, Beater and Storage Rooms; Calender Cooling, Locker Ventilating, Trim Conveying, Fans, Unit Heaters, Filters, Hoods. Consult Ross Engineers without obligation.

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**ROSS ENGINEERING OF CANADA, LIMITED**
NEW BIRKS BLDG., MONTREAL

ROSS SYSTEMS
HEATING—VENTILATING—DRYING

of the Vawter Manifold Company, will be president of the new organization; H. O. Bonnar, heretofore president of the American Fanform Company, will be vice-president and general manager of the consolidated company.

**Brooklyn, N. Y.**—Box Designers, Inc., recently organized under state laws with a capital of $25,000, by Benjamin N. Morton, 1372 Gates avenue, Brooklyn, and associates, is said to be planning early operation of a local factory for the manufacture of paper boxes and containers. Oscar Habas, 669 Manhattan avenue, Brooklyn, is also interested in new company.

**Indianapolis, Ind.**—The United States Corrugated Fibre Box Company, 1315 Martindale avenue, has awarded a general contract to B. H. Bass, 1240 West Ray street, Indianapolis, for proposed new plant unit at location noted, to be one and two-story and basement, totaling about 103,000 square feet of floor space, estimated to cost about $200,000, with equipment. Equipment will be provided for large capacity. Charles E. Bacon, Odd Fellows' Building, Indianapolis, is architect. H. J. Lacey is president.

**Agatite, Tex.**—The Certain-Teed Products Corporation, 100 East 42nd street, New York, is developing maximum capacity at its local wallboard mill, formerly the property of the Beaverboard Company, and will keep the plant on present basis, with full working force, for an indefinite period. The company is reported to be considering the construction of a new unit at the mill to provide for considerable increase in present output.

**Quebec, Que.**—The Donnacona Paper Company, Ltd., a subsidiary of Price & Brothers & Co., Ltd., Montreal, Que., will soon break ground for the construction of a new mill for the production of wallboard on site near Quebec. Contract for structural steel has been awarded to the Dominion Bridge Company, Ltd., Montreal, and superstructure will be carried out by that interest. The plant will be one-story, 150x400 feet, and will be equipped for large output. It is reported to cost close to $1,000,000, including machine shop and other auxiliary mechanical structures.

**Montreal, Que.**—Arrangements have been completed by the Canada Power and Paper Corporation, Montreal, with paper mill at Cap Madeleine, Que., for a merger with the Wayagamack Pulp and Paper Company, Ltd., Three Rivers, Que., and the Port Alfred Pulp & Paper Corporation, Port Alfred, Que. The acquisition will increase the news print capacity of the first noted organization from 1,280 to 1,900 tons per day. Existing mills will be continued in service as heretofore, and the Canada company is reported to be planning a general expansion and betterment program for enlarged output. The merger will also bring about an increase in pulp and kraft papers, as well as provide additional sources of timber supply on the Island of Anticosti, an extensive course at the present time.

**Rensselaer, N. Y.**—The Albany Fibre Company, Inc., Rensselaer, has concluded negotiations for the purchase of a tract of land on Forbes Road, in vicinity of present plant and will soon have plans drawn for a new four-story addition, reported to cost more than $75,000, with equipment. It is understood that work will be placed under way early in the coming year. Carl Lavine is president.

**Everett, Wash.**—The Puget Sound Pulp and Timber Company, Everett, has established offices in the local Medical and Dental Building, and will soon proceed the construction of proposed local mill for the manufacture of bleached sulphite pulp. A contract has been made with the Puget Sound Power & Light Company for power supply for construction purposes, and for complete power service when mill is ready for operation. The estimated load approximates 7,000 kw. The project will consist of several buildings and is reported to cost approximately $2,500,000, with equipment. Ossian Anderson is president.

### New Companies, Etc.

**Washington, D. C.**—The Pulp Products Corporation, Washington, a Delaware organization, has filed notice of increase in capital from $100,000 to $250,00, a portion of proceeds to be used for expansion.

**Brooklyn, N. Y.**—The T.H.J. Paper Box Company, has been incorporated with a capital of 100 shares of stock, no par value, to operate a local plant for the manufacture of paper boxes and containers. The new company is represented by McKennell & Appell, 21 East Fortieth Street, New York, attorneys.

**Gary, Ind.**—The Marsene Transparent Paper Corporation, has filed notice of increase of capital to $150,000, portion of proceeds to be used for general expansion.

**New York, N. Y.**—The De Lackner Paper Novelty Company, has been incorporated with a capital of $25,000, to manufacture and deal in paper goods of various kinds. The company is represented by J. H. Clark, Jr., 120 Broadway, New York, attorney.

**Albany, N. Y.**—The Vortex Manufacturing Company, 421 North Western avenue, Chicago, Ill., manufacturer of paper cups and kindred products, a Delaware corporation, has filed notice of organization to operate in New York, with a capital of 500,000 shares of stock, no par value. The company recently carried out a financing program, with the sale of stock issue aggregating $4,579,000, a portion of the fund to be used for general development and expansion. It is understood that increased output will be arranged. P. T. Potts is president.

## Miami Valley Industrial Conference

[FROM OUR REGULAR CORRESPONDENT]

DAYTON, Ohio, September 30, 1929.—Representatives of manufacturing interests in all of the principal towns of the Miami Valley assembled Saturday, Sept. 29 at the Chautauqua grounds near Franklin to participate in the first annual Miami Valley Industrial Conference.

Thomas B. Fordham of this city acted as general conference chairman and Harry N. Clarke of Cleveland was the principal speaker.

The Conference was opened at 9:30 A.M. by Fordham and Mr. Clarke spoke on the subject, "What Effect Would the Square Deal Have upon Industry".

At 11:15 A.M., the Conference divided into four sections. Leaders for the four groups were:—Dr. Louis Frechtling, of the Champion Coated Paper Company, Hamilton; Walter Brand, Springfield; J. N. Garwood, of the National Cash Register Company, Dayton; and A. J. Beatty, representing the mill interests of Middletown.

Following luncheon Mr. Clarke again spoke, summarizing the results of the morning session.

The afternoon hours from 3 until 6, were devoted to a program of recreation under the supervision of H. N. Sollenberger of Hamilton. Baseball, volley ball, quoit pitching and other diversions were enjoyed by the manufacturers.

The Conference banquet was served at 6 P.M. and the principal speaker at this event was H. C. Blackwell of Cincinnati.

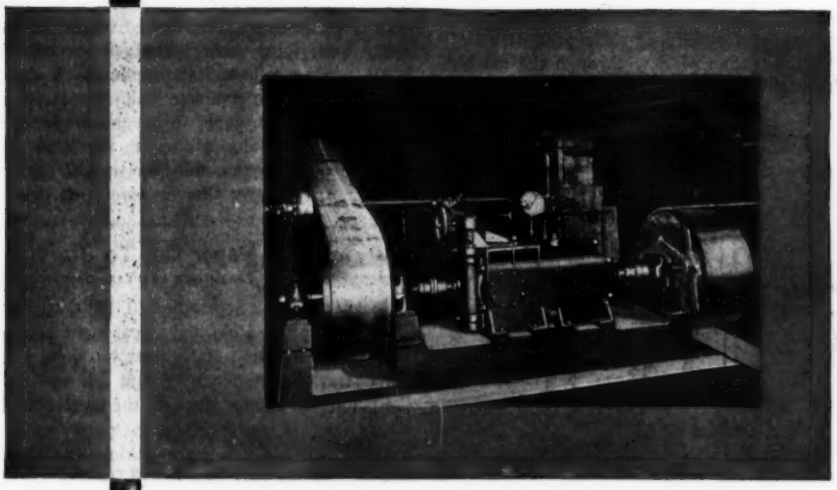
One of the features of the gathering was the Community singing in charge of Leslie L. Diehl, of the Dayton Chamber of Commerce.

Representatives were in attendance from Middletown, Hamilton, Franklin, Lockland, Cincinnati, Springfield, Dayton, Piqua and Richmond, Ind.

## To Build Big Pulp Plant in Finland

The proposed chemical pulp plant now being erected in Kexholm by German-British interests will be the largest in Finland, according to a report from Trade Commissioner William T. Daugherty, at Berlin. The plant will have an initial production of 60,000 metric tons of pulp annually, which will eventually be raised to 120,000 tons. The plant is expected to be finished and ready for operation early in 1931, employing 800 workmen. The new mill will get its pulpwood from Russia chiefly, and is planning to dispose of its entire output in Germany, England, and Italy. The power will be supplied by the company's own plant.

# STEADY 24-hour-day service



## —and no FAILURES

**This Waterbury Hydraulic Variable Speed Transmission is on the drive of a 108-inch 5-cylinder Board Machine. It is one of hundreds of installations of the Waterbury Drive—in paper mills and other industrial fields—made by the Waterbury Tool Company of Waterbury, Conn. In all the years during which NORMA-HOFFMANN Precision Bearings have been used by this manufacturer in his units, there has been not one complaint of the service rendered—even where (as in most paper mill service) the demand is for 24-hour-per-day duty.**

*Let our engineers work with yours—with lower costs and improved performance the objectives.*

PRECISION—and all it stands for in the essentials of true value in bearings—reveals itself most conspicuously where the operating conditions demand continuous service, 24 hours a day, week after week. Here price differences are quickly wiped out in increased production, lower maintenance, freedom from shut-down losses. Serviceability—that's the quality by which to measure and compare, bearings.

# NORMA-HOFFMANN
## PRECISION BEARINGS

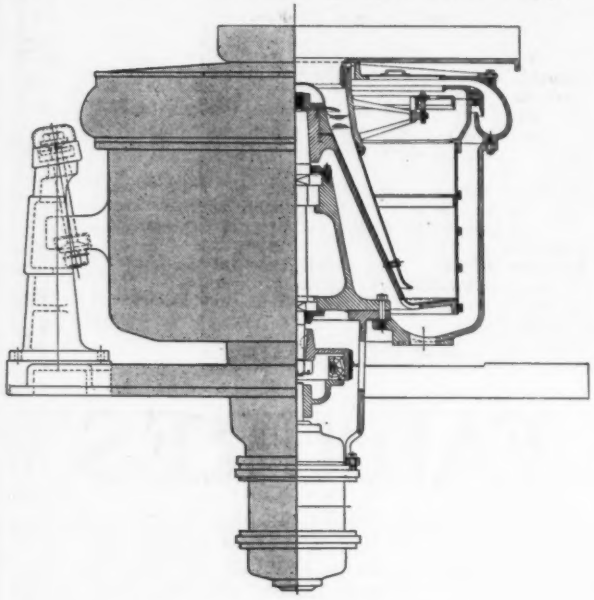
N-1023

**NORMA-HOFFMANN BEARINGS CORPORATION STAMFORD, CONN., U.S.A.**

## New Bird Centrifiner

The Bird Machine Company, South Walpole, Mass., builders of the Bird Screen, Bird Pulp Screen and other products identified with the making of cleaner, more uniform paper, announces the Bird Centrifiner. This machine embodies the remarkable effective centrifugal principle of dirt removal and fiber separation covered by the patents of the Centrifugal Engineering and Patents Corporation as originally employed in the Erkensator. The Bird Machine Company is licensed by the corporation to make use of their patents and these plus the maker's extensive experience and engineering resources have combined to make the Bird Centrifiner a piece of equipment worthy of the greatest interest to all responsible for the cleanliness and quality of their product.

By means of an ingenious system of flow through the machine the pure stuff from which all heavy and light impurities have been



CROSS SECTION OF BIRD CENTRIFINER

completely removed flows continuously from the Centrifiner. The principle is exceedingly simple as the accompanying diagram shows. It is like a simple gravity separator but with its effectiveness multiplied hundreds of times by means of centrifugal force. The heavy dirt is flung to the outer circumference of the whirling stock which is traveling at the rate of 90 miles an hour, the light dirt remains on the inner circumference and the clean, pure stuff, free from even microscopic impurities, is drawn off.

The significance of complete dirt elimination which a Bird Centrifiner installation makes possible must be apparent to all paper makers. Heretofore, the cleanliness of the finished sheet has been relative rather than absolute. Centrifugal separation sets entirely new standards. Now it is possible to make paper that is really clean, without variation. Other important operating advantages are secured at the same time. The finished sheet is stronger and more perfectly formed as a result of thorough separation of all the fiber bundles in passing through the Centrifiner. It is often possible to get satisfactory results with a lower grade of furnish and to reduce or eliminate hand sorting of rags and the like. When the Centrifiner is used before bleaching there is a material saving in bleach because the bleach is all used for bleaching paper instead of dirt. The Centrifiner does away with rifflers, sand traps and magnetic separators and consequently reduces waste and speeds up the process.

The principle of centrifugal separation of paper stuff from dirt and impurities has arrived. Many engineers hail it as the outstanding contribution to the improvement of the paper making process of recent years. Over five hundred successful installations testify to its efficiency and practicability.

## Allege Discrimination in Stopover Rates

[FROM OUR REGULAR CORRESPONDENT]

PORTLAND, Ore., September 20, 1929.—The Hawley Pulp and Paper company and the Crown-Willamette Paper company filed complaints with the Interstate Commerce Commission September 13 alleging discrimination in stopover rates against eastbound shipments from their mills. The companies say that where a car of paper is partially loaded in one mill and completed at another mill, local freight charges are assessed from the origin point, while westbound shipments pay a charge of $6.30 for stoppage in transit to complete loading.

On paper and paper products originating in Camas, Wash., the complainants desire stops at the $6.30 rate at North Portland and Lebanon, Oregon, and Floriston, Cal., to complete loading, and the same at Oregon City on shipments originating at St. Helens.

## Sitka Paper Co. To Start in October

[FROM OUR REGULAR CORRESPONDENT]

PORTLAND, Ore., September 20, 1929.—C. McC. Johnson, head of the Sitka Spruce Pulp and Paper Company, which is completing a mill at Emire, Ore., states that he expects the plant to be ready for operation October 1. About 200 persons will be employed in the plant. In connection with the pulp mill will be a large sawmill which has just begun operations preparing the docks for shipping and the material for pulp making. Estimate of outlay in construction of the two plants is $1,500,000.

Mr. Johnson operated for some time at Reedsport, furnishing pulpwood for the mills at Oregon City and his idea of manufacturing pulpwood and making pulp originated from his former connection.

## News of the Boston Paper Trade

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., September 30, 1929.—Rutter & McNaught, Inc., have added a new line, Brightwood Blank, made by the Holyoke Card and Paper Company, Holyoke, Mass. This line is specially suitable for extra high grade work.

Tileston & Hollingsworth Company have issued their first broadside in a six months campaign, one to be mailed each month, on their papers of Old Fashioned Quality.

Charles H. Wood, managing director of E. Butterworth & Co., Inc., is expected to return today from a two weeks vacation at Poland Springs.

F. A. McAllister, of the New York office of the Waterfalls Paper Mills, and W. R. Ingersoll, of the Dill & Collins Company, Philadelphia, called on the trade here last week.

## To Represent Terry Steam Turbine Co.

The Terry Steam Turbine Company announces the appointment of Farrell & Jones as Boston representatives. Farrell & Jones will be located at 10 High Street, Boston, Mass., and their territory will include the states of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island and the eastern part of Connecticut.

## Schlafer Hardware Co. at Appleton, Wis.

Through an inadvertence in noticing Schlafer's Paper Mill Supply Catalogue just issued, the incorrect address of the Schlafer Hardware Company by whom it is issued was given. The correct address of the company is 115-119 West College avenue, Appleton, Wis.

# TECHNICAL BOOKS

*for*

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***by Clarence J. West***

**Prepared under the auspices of a committee appointed by the American Paper and Pulp Association. The definitions in this book are offered as those generally accepted by the trade. In the preparation of these definitions the committee has made use of all available published data and of the many suggestions received from the industry and trade, through the various sectional committees.**

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**The papers which constitute this book appeared originally in the trade and technological journals as current reports of the progress of investigations under way at the United States Forest Products Laboratory for a period of about six years beginning with 1921. This information is the accumulation of years of experience. The method by which sulphite with the desired properties is to be made, the conditions under which it must be cooked, the strength of acid to be used, the equipment, operation and materials are all fully covered in this book. Included in this volume also is "Sulphite Pulp from Spruce" by Donald E. Cable.**

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In this edition, the literature has not only been brought up to date, but many additions have been made to the earlier work.

The paper making materials have been listed in dictionary style under the common and botanical names, the references being given only under the latter.

Books and articles are listed under the author (or title) in the dictionary arrangement, and to refer under each material, to the author, and the year of publication.

This list includes all the woods tested at the Forest Products Laboratory, as well as many tested by the Imperial Institute of Great Britain and by other workers.

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## PAPER TESTING METHODS

Method of procedure for adoption of official paper testing methods by the Technical Association of the Pulp and Paper Industry. The work on standardization of paper testing methods is divided as follows: Microscopical, Physical, Chemical, Optical, Tests for Special Uses of Paper.

A number of new proposed methods and testing instruments are described, and much of the text has been rewritten wherever found necessary as a result of developments since the previous edition.

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# New York Trade Jottings

Robert Pomerance, of the Forest Paper Company, New York, has returned to duty after an extended tour of Europe .

* * *

F. H. Luning, paper mill supply dealer, is now located in the Pennsylvania Terminal Building, 370 Seventh Avenue, New York.

* * *

The du Pont Celophane Company, of 2 Park Avenue, New York, announces that J. A. Hart is now a member of its advertising and sales promotion section.

* * *

John J. Spinelli, dealer in paper mill supplies, has removed from 225 Broadway, New York, to 12 79th street, Brooklyn, N. Y. The new telephone number is Shore Road 7469.

* * *

The American Paper and Pulp Association has just issued a new bulletin entitled "The Closed White Water System." This bulletin presents methods of studying the white water problem in the paper industry. It is based upon the experience and study of the association's engineer in connection with his general studies of waste utilization and stream improvement.

* * *

There was a good attendance of members at the regular weekly luncheon and meeting of the New York Division of the Salesmen's Association of the Paper Industry held in the Canadian Club last Monday. Vice President Endicott Rantoul occupied the chair and introduced the guest speaker, Carleton Ficker, assistant editor of the Trade Service of the Standard Statistics Company, New York, who analyzed the prevailing business situation in a comprehensive manner.

* * *

An interesting article entitled "Wire Cloth for Paper Making" in the current issue of *Wire and Wire Products*, published at 551 Fifth Avenue, New York, from the pen of Clarence Beebe, is of special interest to the paper industry. Mr. Beebe has spent so many years in the paper industry that he is, of course, thoroughly familiar with this subject and naturally handles it in a manner that is both interesting and instructive. More articles on this subject will, it is understood, appear in this publication from the pen of Mr. Beebe.

## W. L. Glass Goes With Tolhurst Machine Works

The Tolhurst Machine Works of Troy, N. Y., manufacturer of the Tolhurst Centrifugal for fiber treatment in pulp and paper making, announces that Walter L. Glass has joined the Tolhurst organization as manager of paper mill sales.

For the past four years Mr. Glass has been manager of the paper mill sales division of the B. F. Goodrich Rubber Company of Akron, Ohio. Previous to joining the Goodrich organization, Mr. Glass had several years experience in pulp and paper mill engineering and operation in the middle west and Canada.

Mr. Glass is a graduate of Syracuse University, class of 1916 and is a member of both the Canadian Technical Section of the Pulp and Paper Industry and the Technical Association of the Pulp and Paper Industry.

## Whiting Paper Co. Increases Wages

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., September 17, 1929.—Officials of Eagle Lodge Papermakers were notified at their meeting Sunday that the Whiting Paper Company had increased their wage scale two cents an hour to machine men and beatermen bringing it up to the scale now in force in all of the Holyoke mills. About 20 men are affected by the increase which affects the men in the No. 1 and No. 2 mills and also in the new mill in the former Lyman Mills property.

## Reduction in Miami Valley Freight Rates

The Interstate Commerce Commission has just issued proposed report by Examiner Mattson covering Docket 21,332; the Advance Bag and Paper Company et al. vs. The Baltimore and Ohio Railroad Company et al., in which the examiner recommends very substantial reductions in freight rates on wrapping paper, printing paper, waxed wrapping paper, gummed paper tape, and various kinds of paper bags from points in the Miami Valley; viz., Hamilton, Middletown, Franklin, West Carrollton, Dayton and also Chillicothe, Ohio, to numerous cities in Western Trunk Line territory, some of which are Kansas City, Mo., Omaha, Neb., Des Moines, Iowa, Sioux City, Ia., Joplin, Mo., Moberly, Mo., St. Joseph, Mo., Springfield, Mo., Hastings, Neb., Lincoln, Neb., North Platte, Neb., Anthony, Kan., Arkansas City, Kan., Atchison, Kan., Emporia, Kan., Great Bend, Kan., Topeka, Kan., Wichita, Kan., Denver, Col., Colorado Springs, Col.

The various complainants in this case were as follows: The Advance Bag and Paper Company, the Beckett Paper Company, The Champion Coated Paper Company, The Maxwell Paper Company, The Mead Pulp and Paper Company, The Miami Valley Coated Paper Company, The Nashua Gummed and Coated Paper Company, The Oxford-Miami Paper Company, the Paul A. Sorg Paper Company.

The examiner further recommends that no relief be granted Michigan paper mills or any other interveners. He also recommends that reparation be granted to the Lawrence Bag Company and the Advance Bag and Paper Company on past shipments.

## Better Demand in Indianapolis

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., September 30, 1929.—A somewhat increasing demand for some lines of paper is noticed here. The demand is not at its fall peak yet, or the local jobbers will be very much disappointed, and most of them feel there will be a further expansion before cold weather. The impetus during the last week or two in the better paper lines has been due largely to the opening of schools and colleges in the state.

The approaching holidays are becoming more evident in the inquiries being received for specialties, particularly glassine papers and box papers. From all indications the boxes used this Christmas will be more ornate than ever before. More and more Indiana manufacturers also are using glassine papers for wrappers and this has increased the demand for this stock.

Some demand continues for roofing papers, but sheathing and other building papers have fallen off in demand. This is not unexpected since the local building season is getting toward the end.

Paper mills in various parts of the state, mostly straw board mills, report a fair demand and most of them are keeping busy.

Various grades of card boards used in the printing and advertising fields, are a little more active. News print continues steady with some increase in volume over a month ago. The volume, however, is nothing to rave about.

## International Electrician Injured

[FROM OUR REGULAR CORRESPONDENT]

CORINTH, N. Y., September 21, 1929.—Harold Hagadorn, chief electrician at the plant of the International Paper Company, was seriously injured and narrowly escaped death during the past week when 550 volts of electricity passed through his body while he was repairing wires on a wood conveyor in the mill yard. He was working on a line when in some manner both his hands came in contact simultaneously with a live wire carrying the heavy voltage which resulted in his body being thrown away from the current in a semi-conscious condition. Dr. Howard Johnston, plant physician, was immediately summoned and succeeded in reviving him following which he was treated for very severe burns on the palms of both hands. It may be several days before the burns are sufficiently healed to allow the injured man to return to work.

# CHEMICAL AND MECHANICAL PULP

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**Hallein and Villach, Austria**

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**Bergvik och Ala Nya Aktiebolag, Söderhamm, Sweden**
**Svanö Aktiebolag, Svanö, Sweden**
**Aktieselskabet Greaker Cellulosefabrik, Greaker Norway**

## KRAFT PULP

**Nensjö Cellulosa A.—B., Sprängsviken, Sweden**
**Bergvik och Ala Nya Aktiebolag, Söderhamm, Sweden**
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Vol. LXXXIX New York, October 3, 1929 No. 14

## PAPER HEADS LIST IN CANADA

The Forest Products Branch of the Dominion Bureau of Statistics has just issued a report on the pulp and paper industry in Canada which shows that this industry is the most important manufacturing industry in Canada; heading the lists in 1928 for gross and net values of manufactured products as well as for distribution of wages and salaries. In total capital invested the industry is second only to electric light and power plants and in total number of employees it is second only to saw-mills.

The industry, the report proceeds, has headed the lists in wage and salary distribution since 1922 when it replaced saw-mills in this respect and it has been first in gross value of products since 1925, exceeding the gross value of flour mill production.

Considering only the manufacturing aspect of the industry, the gross value of production in 1928 was $233,535,326, an increase of 6.5 per cent over the figure for 1927. The gross values of the manufactured products of the industry for the last five years are as follows: 1924, $179,259,504; 1925, $193,092,937; 1926, $215,370,274; 1927, $219,329,753; 1928, $233,535,326.

This gross value represents the sum of the values of pulp made for sale in Canada, pulp made for export and paper manufactured. It does not include pulpwood nor the pulp made in combined pulp and paper mills for their own use in making paper.

With regard to the net value of production the pulp and paper industry has headed the lists since 1920 when it replaced the saw-mills. The net value of production for the last five years was as follows: 1924, $107,025,628; 1925, $116,577,947; 1926, $130,004,809; 1927, $134,516,673; 1928, $145,070,907.

If operations in the woods are taken into consideration, the total value to Canada of the industry as a whole may be considered as the sum of the values of pulpwood and pulp exported and the gross value of paper products. This removes any duplication that might arise by the inclusion of pulpwood used in Canadian pulp mills, and pulp used in Canadian paper mills but makes no allowance for pulp that might be used in Canada for purposes other than the manufacture of paper, such as the manufacture of artificial silk, fibreware, etc. This total in 1928 amounted to $245,346,839, an increase of 6.1 per cent over 1927.

There were 110 establishments in operation during 1928 as compared to 114 in 1927. Of these mills 33 made pulp only, 46 were combined pulp and paper mills and 31 made paper only.

In Nova Scotia one pulp mill ceased operations. One pulp mill in New Brunswick closed down but another started to manufacture paper as well as pulp. Two pulp mills in Quebec and one in Ontario closed down but two Quebec pulp mills started making paper during the year. One pulp mill in British Columbia ceased operating during conversion into a combined pulp and paper mill. Two new combined pulp and paper mills came into production in Quebec during 1928 and one combined mill now manufactures paper board only. One board mill in Quebec and another in Ontario ceased operations but were replaced by two new mills. There was a net loss of nine establishments making pulp only, a gain of four combined pulp and paper mills and a gain of one mill making paper only, making a net total loss of four establishments. There is a tendency at the present time toward the building of the larger combined pulp and paper mills especially those known as "self-contained newsprint mills," and a tendency toward the merging of the various companies engaged in the industry into a comparatively small number of large groups.

The 79 mills manufacturing pulp produced 3,610,724 tons valued at $121,458,078 as compared to 3,278,978 tons in 1927 valued at $114,442,541 representing an increase of 10.1 per cent in quantity and 6.1 per cent in value. Of the total for 1928 the combined pulp and paper mills produced 2,631,106 tons valued at $72,385,108 for their own use in paper-making. A total of 117,874 tons valued at $5,708,577 were made for sale in Canada and 861,744 tons valued at $43,364.393 were made for export.

The 77 mills making paper in 1928 produced 2,849,687 tons of paper valued at $184,462,356 as compared to 2,468,691 tons in 1927 valued at $168,445,548 an increase of 15.4 per cent in quantity and 9.5 per cent in value.

News print paper made up 84.7 per cent of the total reported tonnage of paper manufactured in 1928. The news print amounted to 2,414,393 tons valued at $114,146,632, as compared to 2,082,830 tons in 1927 valued at $132,286,729, an increase of 15.9 per cent in tonnage and 9 per cent in total value. Under the heading of newsprint in Canada are included news print in rolls and sheets for printing, hangings and poster paper. The reported news print production in the United States during the calendar year 1928 was 1,414,952 tons but this figure does not include hangings or poster paper. When these two classes are deducted from the production in Canada during the calendar year 1928 the figure for comparison is 2,396,238 tons, showing that the Canadian production of this commodity was almost seventy per cent greater than that of the United States during 1928. This increase has continued during the current year and in the first eight months of 1929 the Canadian output of news print was estimated at almost

double that of our nearest competitors in the world's news print market.

The total capital invested in the manufacturing part of the industry in 1928 was $685,687,459 as compared to $579,853,552 for 1927, an increase of 18.3 per cent. Only capital invested in mills operating in 1928 is included in this total.

The total number of employees on salaries and wages in pulp and paper mills in 1928 was 33,614 and the total payroll was $47,322,648 as compared to 32,876 employees in 1927 with salaries and wages amounting to $45,674,293.

The apparent total production of pulpwood in 1928 was 6,323,610 cords valued at $74,818,467 as compared to 5,929,456 cords in 1927 valued at $70,284,895. Of the total production in 1928 about 75.8 per cent or 4,191,344 cords valued at $59,548,807 were manufactured into pulp in Canadian pulp-mills while the remaining 24.2 per cent or 1,532,266 cords valued at $15,269,660 were exported to the United States. These figures show a decrease from 26 per cent in 1927 to 24.2 per cent in 1928 in the proportion of pulpwood exported, and the actual quantity of pulpwood exported unmanufactured also shows a decrease. The quantity of pulpwood used in Canadian mills has increased by 9.2 per cent during this period. There are no importations of pulpwood into Canada.

The total value of all materials going into the manufacture of pulp in 1928 was $69,422,248 and the total value of all pulp produced, including that made in combined pulp and paper mills for their own use was $121,458,078.

The total value of all materials used in the manufacture of paper in 1928 including pulp made in combined establishments for their own use was $91,451,653; the total value of paper and miscellaneous pulp products manufactured was $184,462,356.

The exports of wood pulp from Canada during the calendar year 1928 amounted to 17,276,019 cwt. valued at $45,614,823 as compared to 17,583,085 cwt. in 1927 valued at $46,996,041. During the same calendar year the imports of wood pulp were 448,472 cwt. valued at $1,107,801.

The exports of paper and paper goods during the calendar year 1928 were valued at $147,156,792 as compared to $129,637,687 in 1927. These exports were made up chiefly of news print paper of which 44,131,754 cwt. valued at $141,103,527 were exported chiefly to the United States. Canada's exports of news print are now second only to her exports of wheat and are greater than the news print exports of the rest of the world. The 1928 exports represent an increase in quantity and in total value over the 37,637,308 cwt. valued at $123,222,094 which were exported in 1927. During 1928 the total value of paper and paper goods imported was $13,260,288, an increase over the imports for 1927.

The gross contribution toward a favorable trade balance resulting from the activities of the pulp and paper industry as a whole in 1928 amounted to approximately $193,673,186 being made up of the value of pulpwood exported amounting to $15,269,660, the difference between the value of pulp exported and pulp imported amounting to $44,507,022 and the difference in value between paper exports and imports amounting to $133,896,504. The total for 1927 was $179,459,362.

Reviewing the industry as a whole it is seen that the exportation of unmanufactured pulpwood is decreasing in quantity and relative importance while the further manufacture of this raw material into pulp in Canadian mills is increasing at a rapid rate.

Pulp manufacture is increasing in quantity and value, the largest increase taking place in pulp made in combined mills for their own use in paper-making. Pulp made for sale in Canada also increased while there was a decided decrease in the manufacture of pulp for exportation without further manufacture in Canada.

In the production of paper, the final stage in the industry, the increase was over 15 per cent for quantity and over 9 per cent for total value in spite of the decrease in the average value of news print.

In the pulp and paper industry, a tendency toward the more complete and profitable utilization in Canada of raw or partly manufactured materials is clearly indicated.

## Oswegatchie Paper Co. Sued

GOUVERNEUR, N. Y., September 21, 1929.—An action has been started in Supreme Court by the Oswegatchie Light and Power Company against the Oswegatchie Paper Company, of Natural Dam, with Justice O. Byron Brewster presiding. The power company claims that the paper firm owes them for electric power furnished and for some labor and machinery. On the other hand the paper company claims to have overpaid the power company and has started a counterclaim. Castle & Fitch, of Rochester, are handling the case for the plaintiff and Attorney Arthur Johnson, of this place, is representing the defendants.

It is reported on good authority that the Oswegatchie Paper Company will soon be in a position to resume operations at its Natural Dam plant because of improved business conditions. The company's mill has been idle for several months because of the lack of demand for its products. The firm, however, recently sold a carload of stock on hand and it has been stated that there are bright prospects of selling more news print in the near future.

## Miami Valley Superintendents Meet

DAYTON, Ohio, September 30, 1929.—The Miami Valley Division of the American Pulp and Paper Mill Superintendents Association opened the fall and winter season September 28 at the Hotel Anthony Wayne in Hamilton.

The Black-Clawson Company, of Hamilton, manufacturers of paper mill machinery, and Shartle Brothers, Middletown also engaged in the machinery trade, co-operated in the entertainment program for this event.

Wilson W. Galloway, of the Hager Straw Board and Paper Company, of Cedarville, Ohio, 20 miles east of Dayton, acted as chairman.

The Miami Valley Division will continue its plan of holding monthly meetings throughout the year. Various mill centers will be chosen for these sessions though the program for the entire year has not been completed.

## Casein Amendment Would Increase Duty

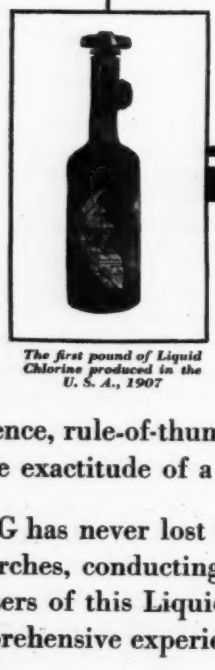
WASHINGTON, D. C., October 2, 1929.—Senator Shortridge of California has introduced an amendment to the tariff bill which would increase the rate of duty on casein from 3½ cents as recommended by the Senate Finance Committee to "8 cents per pound but not less than 60 per cent ad valorem."

## Made Vice President of Seaman Paper Co.

The Seaman Paper Company announces that Harold L. Cowan has been elected a vice president of the company. Mr. Cowan will remain in charge of the Buffalo office of the Seaman Paper Company.

# Events of 1909

*Bleriot makes the first flight across the English Channel, 1909. Here shown rounding the stake at Rheims.*



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Edited by
RONALD G. MACDONALD, Secretary

# What is Patentable in Paper Making?*

By Charles W. Rivise [1]

An inventor is one who has made a valuable discovery. At common law he had no special property right in his brain child. The only way he could keep others from using his invention was to withhold all knowledge of it from the public. This he could do either by suppressing it entirely or by practising it as a "trade secret".

In the first case he deprived not only the public but also himself of all possible benefit of his genius. In the latter case he could reserve to himself the exclusive use of his discovery only as long as he succeeded in keeping its details from the public To do this he had to take all sorts of precautionary measures and resort to all sorts of subterfuges such as allowing misleading information to fall into the hands of his competitors and marking the thermometers and gauges with false scales so that only he or some trusted employee could read them.

However, even with the greatest precautions there was always the possibility that a competitor would stumble across the secret by accident or rediscover it by analysis and experimentation. In one instance an enterprising competitor is said to have discovered a very carefully guarded secret by analyzing the sewage from the plant of his rival. And there are numerous instances in which a closely guarded secret yielded to a careful analysis of the product.

Another danger that could not always be guarded against was the divulging of the secret by a faithless employee. It is true that in such a case the courts will prevent a dishonest competitor from availing himself of the stolen information, but as frequently happens the general public also learns the secret and it becomes public property.

Under such a system the arts and sciences could make but very slow progress. Realizing this, the framers of our Federal Constitution laid the basis for our present patent system, under which the government promises to protect the inventor in his exclusive enjoyment of the invention for a term of years provided he makes such a full and exact disclosure of his invention that the public can practise it after the expiration of the inventor's monopoly.

However, it must be borne in mind that the patent statutes do not compel an inventor to apply for and obtain a patent. If his discovery is of such a nature that he feels that it is safe from discovery either by observation of his invention, or by independent investigation and experimentation, he would have a much more endurable monopoly by refusing to take advantage of the patent laws. Such is his natural right. It is only when he fears discovery and resultant injury from the exercise by others of his invention that he need protect it by a patent. However, the inventor who elects to protect his invention by secrecy rather than by seeking patent protection always runs the risk of losing his right to a patent when his secret leaks out.

Such was the situation in the case of Mac Beth Evans Glass Company vs. General Electric Company reported in 246 Federal Reporter 695. In that case it appeared that the Mac Beth Company had for a period of ten years made glass under a secret process until the secret was stolen by a competitor through a dishonest employee. Suit was brought against the competitor and he was enjoined from making use of the stolen information. The details of the process, however, leaked out and the Mac Beth Company, to protect its rights against other competitors, applied for and secured a patent. Suit was then brought against General Electric Company, one of the competitors, to stop it from infringing the patent, but the court held the patent invalid on the ground that by choosing to keep its process secret, the Mac Beth Company had abandoned its right to patent protection.

### Disclosure of the Invention

In order to take advantage of the protection afforded by the patent statues, the inventor is required to make a written description of his invention or discovery and of the manner and process of making, constructing and using the same in such full, clear, concise and exact terms as to enable any person skilled in the art or science to which the invention or discovery appertains, to make, construct, compound and use the same. Any disclosure that falls short of this requirement will result either in the refusal of a patent or in the grant of an invalid patent.

It must be emphasized, however, that the inventor is not bound to state all the advantages and functions of his invention or all the uses to which it may be put. Neither is he required to state the scientific principles or theory underlying his invention or the causes which produce the desirable result. And if he does state what he believes to be the principles governing his discovery, it is wholly immaterial to the validity of the patent whether or not the statement is correct, as long as he has so set forth the thing to be done that it can be reproduced by one skilled in the art.

An interesting case involving this point is that of Van Epps v. United Box Board and Paper Company reported in 143 Fed. Rep. 869. In this case the defendants who were charged with infringing the Victory Patent No. 417,451 for a pulp screening

*Presented at Fall Meeting of TAPPI, Richmond, Va., Sept. 24, 1929.
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[1]Assoc. Mem. TAPPI, Patent Attorney, 1321 Arch Street, Philadelphia.

service, sought to escape liability on the ground that the inventor had predicated its operation on an erroneous theory that the constantly present air underneath the screen plates caused a powerful downward suction in the chamber by being forced alternately up and down through slots in the screen plates. The patent itself was silent on the theory of operation. The court summarily rejected the defendant's argument with the statement that the patent clearly disclosed what was to be done and that an understanding of the theory was not necessary to carry out the teachings of the patent.

### Patent Claims

The law further requires the inventor to point out and distinctly claim the part, improvement or combination which he claims to be his invention or discovery. This he must do in one or more short statements at the end of the description. Each one of these statements is termed a claim.

The claims are the vital part of the patent and define the scope of the patent. Great skill is required in drafting them. Uusually the patent examiner does not agree with the inventor that the presented claims represent his contribution to the art. In such cases the inventor may amend the rejected claims or try to persuade the examiner to his own way of thinking. When the inventor and the examiner finally agree, the patent is granted with the claims agreed upon. If they cannot agree, the inventor may appeal to a higher tribunal in the Patent Office and then to the courts. But, if the inventor acquieces in the rejection of a claim and the patent is granted with a narrower claim, he is forever estopped from contending that he was entitled to the broader claim.

Such was the situation in the case of Winchester Repeating Arms Company v. Peters Cartridge Company reported in 184 Fed. Rep. 332 involving Patent No. 563,157 granted to Gardner on a Paper Shell Cartridge. The court held in effect that Gardner had been entitled to a broader claim than any included in his patent, but that by acquiescing in its rejection by the Patent Office he lost his right thereto. As a result he could not recover against the defendant who infringed the broader claim but avoided the narrower one.

Each claim in a patent is considered a separate and independent invention. One may be valid, all the rest invalid. But the claim that is good remains good and is unaffected by the presence of those that are bad. Likewise one claim may be infringed and the others not. In other words the patent does not stand or fall as a unity—each claim is in effect a separate patent.

### Patentable Subject Matter

No matter how ingenious or epoch making an invention or discovery may be, no valid patent can be secured, unless the subject matter thereof can be expressed in one or more of the following ways:—(1) An art; (2), A Machine; (3) A manufacture; (4) A composition of matter; (5) An improvement on an already existing art, machine, manufacture or composition of matter, or (6) A design for an article of manufacture.

In defining each of these terms, examples taken from litigated paper making patents will be used as far as possible. This policy will also be followed in the rest of the paper, which goes thoroughly into the question of what constitutes invention.

### Art or Process

The term "art" is commonly considered synonymous with the word "process" and may be best defined as "an operation performed by rule to produce a desired result by means not solely mechanical."

A patentable process may consist of one or more steps. An excellent example of a one-step process is that defined in a claim of Weston's Reissue Patent No. 13,730, which reads as follows:—

"The method herein described of manufacturing paper having a thinned portion, which consists in removing from the web at the portion to be thinned along a definite line, some of the material by the application of air pressure thereto."

This claim was held valid in the decision of Weston Company v. L. L. Brown Company reported in 20 Fed. Rep. (2nd) 183.

Splendid example of processes of more than one step or operation are disclosed in Patent 216,108 to Scott dated June 3, 1879 and McLauchlin's patent No. 511,789 dated Jan. 2, 1894. The first patent is directed to a method of making manila, jute or linen paper limp and flexible by treating it with a waterproofing size and then passing it through breaking rollers.

The second patent describes a method for rendering sulphite or chemical wood-fiber paper soft and pliable by moistening it with a thin water solution of gelatin, and then crumping and pounding it and finally drying and smoothing it. The two patents were held valid in the case of American Fibre Chamois Company v. Buckskin-Fibre Company reported in 72 Fed. Rep. 508.

It will be noted that in each one of the patents just mentioned the mechanisms for producing the desired results were admittedly old. There was certainly nothing new in the paper making machine disclosed by Weston, nor in the air hose utilized in creating the air pressure for removing some of the stock along the desired line. Likewise the means disclosed by both Scott and McLauchlin for pounding the paper to make it flexible were not new with them. In fact any one skilled in the paper art can without exercising any inventive ingenuity devise other mechanism capable of carrying out the steps disclosed in these patents. Some of the operations can even be performed by means of simple tools or by hand.

Hence it may be stated as a general rule that the tools or apparatus utilized in carrying out a process are of minor importance as far as the patentability of the process is concerned. In fact the steps or operations themselves should be as far as is possible independent of the form or kind of tools used. This is indicated in the definition that has been given of the term "art".

If the steps of the process are not independnt of the form or kind of tools or apparatus utilized in performing them, the courts will hold a claim covering the process invalid, as being for the mere function or mode of operating the machine. The usual test to determine whether a so-called method is a true process or the mere function or mode of operation of a machine, is whether the process can be carried out by more than one form of machine or tool. If it can, it is a true process, otherwise, not.

It is conceivable that a process may be invented that can be carried out by means of a newly invented machine. In that case both the method and the machine may be patented, either in the same or different patents. This was the case in Hammerschlag v. Scamoni reported in 7 Fed. Rep. 585 (1881) involving a patent covering both a method and a machine for making waxed paper for wrapping butter, cheese, etc. The method consisted in spreading wax on one surface of the paper, heating the paper from the opposite side to spread and fuse the wax into the fabric of the paper, removing the surplus wax and polishing the wax upon the paper. The court held that both the method and the machine utilized for carrying out the process were new and entitled to patent protection.

Obviously a method of doing something by machine that had previously been done by hand is not patentable, if the hand and machine methods are essentially the same. Nor is an old method performed by means of a new tool patentable as a method. In both cases, however, the machine or tool may be patentable.

An apparent exception to what has just been said is contained in the case of Hammerschlag v. Scamoni above mentioned. In that case the defendant urged that previously to the alleged invention waxed paper for the same purpose had been made by hand. The court, however, held the method entitled to patent protection on the ground that

"where previous to the invention the article was not capable of being made by machine or mechanical process then known, and being made by hand was too expensive for general use; and where by reason of the invention, the article is made of superior quality and greatly cheapened in price, and on these

accounts has created a new industry; the patent securing such invention is entitled to be termed a pioneer patent."

A careful study of the facts in the case, however, makes it evident that the old hand methods did not contain the same sequence of steps disclosed by the patentee.

### Machine

A machine has been defined as "an instrument composed of one or more mechanical powers and capable when set in motion, of producing by its own operation, certain predetermined effects." The definition can best be illustrated by a claim of Patent No. 303,374 to Hoyt dated August 12, 1884 which reads as follows:—

"A rag engine for paper making consisting of a vat, a beater roll mounted on a horizontal shaft in one end of the vat, a horizontal partition dividing the body of the vat into upper and lower sections or passages, the fibrous material and liquid being carried from the lower section between the knives and delivered over the top of the beater roll into the upper section."

This patent was held valid by the Supreme Court in the case of Hoyt v. Horne 145 U. S. 302.

### Manufacture and Composition of Matter

The term "manufacture" is synonymous with article of manufacture and is best defined as "whatever is made by the art or industry of man, not being a machine, a composition of matter or a design."

A composition of matter may be defined as that which is formed by the intermixing of two or more substances, whether it be by chemical union, mechanical mixture or both, and whether the ingredients be fluids, solids or gases.

The difference between a machine and an article of manufacture is that a machine has a law of operation inherent within itself while an article has no inherent law but depends entirely upon external forces. The difference between an article of manufacture and a composition of matter is that in a composition the patentable quality resides in the novel combination of ingredients, while the patentability of an article depends upon the inherent characteristics of the article itself. It follows therefore that an article may be composed in whole or part of a composition of matter, which in itself may be novel and form the subject matter of a patent.

A good example of an article composed of an old composition of matter is that defined in a claim of Patent 397,259 to Adolph Tsheppe for Napthaline Paper, which was held valid in the decision of Tsheppe v. Bernheim reported in 42 Fed. Rep. 59. The claim reads:—

"As a new article of manufacture, the sheet (a) having a coating (b) of naphthaline, in two or more layers, the first presenting a rough appearance, the second filling up the interstices of the first layer, and presenting a hard, compact, porcelain-like appearance with a smooth surface substantially as described."

If naphthaline had been new with Tsheppe there is no reason why he could not have protected it by a patent for a new and useful composition.

As examples of compositions that have been patented may be mentioned the artificial plastics of the Bakelite and Celluloid type. These materials can be bought in the form of rods, rings, bars and sheets, in which forms they are really articles of manufacture. They can also be fashioned into articles such as beads, fountain pens, etc.

An article is entirely independent of the machine or method by which it is made. Many articles are still made by old hand processes. If the machine or method by which the new article is made is also novel, it may be protected in the same or a separate patent. In fact it is possible to secure patent protection on a machine, method, article, and composition, if the composition be new and can be made into a new article of manufacture by performing a new series of steps by means of a new machine. Usually the invention of a new composition is followed almost immediately by many new methods of making the composition as well as new uses and applications of the new composition, many of which form the basis for valid patents for compositions, articles, methods and machines.

As a general rule an old composition in a new and different state or condition may be patentable as a new composition. An instance of this is calcium carbide in the form of aggregated crystals, which was held to be proper subject matter of a patent in the decision of Union Carbide Company v. American Carbide Company 181 Fed. Rep. 104.

### Improvement

An improvement is an addition to or an alteration in some already existing art, machine, manufacture or composition. It need not be better in all respects than the thing upon which it purports to be an improvement. At the present state of the arts most of patents being applied for are but improvements on some basic patent. However the day of generic or basic patents is not yet past.

### Design

A design may be defined as that which gives a peculiar or distinctive appearance to an article of manufacture. The appearance may be the result of peculiarity or configuration, or of ornament alone, or of both conjointly, but, in whatever way produced, the new thing is the subject of a design patent. However, if the main purpose of the configuration is for mechanical utility, it cannot form the basis for a design patent. Nor can a valid design patent be gotten for a machine, no matter how much its appearance appeals to the esthetic senses.

### Unpatentable Discoveries

It follows from what has already been said that many inventions and discoveries fall outside of the pale of patent protection for lack of patentable subject matter. In this category may be placed abstract forces of nature, causes and effects. Thus in the case of M'Ewan Bros. v. M'Ewan 91 Fed. Rep. 787, it was held that the mere discovery that a board already on the market had inherent strength did not entitle the first person to observe this fact to a patent.

The discovery that ether would produce insensibility to pain in animals and human beings was held not a proper subject matter for a patent in the celebrated case of Morton v. New York Eye Infirmary Company, 5 Blatchford 116.

In the case of In re Kemper Federal Case No. 7,687 the facts were these:—The alleged inventor discovered that blocks of ice placed on edge, due to the peculiar action of air currents within the ice, melted less rapidly than when laid flat. The court held this discovery to be unpatentable.

In the case of Wall v. Lech 66 Fed. Rep. 553, it appeared that the old process of fumigating plants and trees by hydrocyanic gas, after covering them with an oiled tent, was more effective in the absence of actinic rays of the sun. The court held that the idea of carrying out the process at night or in foggy weather was not patentable. And in the leading case of O'Reilly v. Morse 15 Howard 62, the Supreme Court held that Morse could not claim the exclusive right to his discovery that electromagnetism can be utilized as a motive power for making intelligible marks at a distance, on the ground that it would amount to giving him a monopoly on one of the forces of nature for a particular purpose.

In all of the decided cases the courts have taken great pains to to point out that though neither the cause nor its effect is patentable by itself, the means by which the cause is applied to produce the effect is patentable. Likewise, a new property discovered in matter, when practically applied in the making of a new manufacture or composition may be the basis of a valid patent. In other words the principle of nature itself is not patentable, but its utilization by means of an art, machine, manufacture or compostion of matter when properly expressed in one of these forms, is patentable.

Thus the Supreme Court allowed Morse patent protection on his telegraph apparatus. And in the case of American Box Machine Company v. Wilson Paper Machine Company 71 Fed. Rep. 884, the court held that the patentee of Patent 244,919 had discovered

that paper moistened with paste must be in the air a few moments before being laid on the box and that he had invented mechanical means to adapt the discovery to actual use. He was, therefore, held entitled to protection on his machine but not on his discovery.

A similar situation existed in the Hammerschlag case already referred to, in which case the court pointed out that though the method and machine for making waxed paper were the outgrowth of the discovery of the principle of nature that heat applied to the opposite side of a wax coated sheet of paper would fuse the wax and cause it to premeate the fabric uniformly, it was the arrangement of steps and of mechanical elements that made the patent valid and not the discovery by itself.

On the whole the policy of the patent law to protect the utilization of the forces and principles of nature rather than the abstract discoveries themselves has reacted very beneficially upon industry. This is reflected in the large number of patented inventions consisting either partially or wholly in the utilization of forces or powers of nature, such as chemical reactions, heat, magnetism, electricity, hydraulics, light, pneumatics, etc. As an example of a process utilizing an elementary principle of pneumatics may be mentioned the Weston patent for forming a thinned portion along a web of paper. Among the many employing chemical and physical forces may be mentioned the process disclosed in the basic patent of the sulphite industry (Patent 70,485 to Tilghman dated Nov. 5, 1867).

### Invention

Having decided the question of patentable subject matter in the affirmative, it is then necessary to determine whether or not inventive ingenuity has been exercised in producing the alleged invention. For it has never been the object of the law to grant a monopoly for every shadow of a shade of an idea, which would naturally occur to any one working in the art or for every trifling device which could be produced by a skilled mechanic whenever required.

Presence of invention is always determined from the result and never from the mental process of the inventor. It is immaterial how small may be the actual effort involved—how easily, or how quickly the idea may have come to the inventor. It may have been the result of deliberation, conscious or unconscious, or of intuition or of any other exercise of the reasoning faculty. It may even have been the result of a happy thought or of what is usually termed an accidental discovery.

Simplicity does not necessarily imply the lack of invention. As a matter of fact and of law the highest trait of genius is to obtain simplicity. Thus in the case of U. S. Mitis Company v. Midvale Steel Company 135 Fed. Rep. 103 it was held that the adding of a small piece of aluminum to the iron or steel after it has fully melted and just as soon as it is about to be poured into the mold, for the purpose of making the casting free of "blow holes" involved invention of the highest order.

Simplicity must not be confused with obviousness. They are far from being synonymous terms in the patent law. As has already been pointed out, simplicity is not evidence of lack of invention. Obviousness, on the other hand, is such evidence. But it must be strongly emphasized that if the advance in the art, however slight, appears obvious only after it has been made, this is no evidence of the lack of invention.

For, as has been authoritatively stated by the Supreme Court in the case of Diamond Rubber Company v. Consolidated Tire Company 220 U. S. 428,

> "Knowledge after the event is always easy, and problems once solved present no difficulties, indeed, may be represented as never having had any, and expert witnesses may be brought forward to show that the new thing which seemed to have eluded the search of the world was always ready at hand and easy to be seen by a merely skillful attention. But the law has other tests of the invention than subtle conjectures of what might have been seen and yet was not."

And, as stated by the District of Columbia Court of Appeals in the case of In re Huff 1919 C. D.152,

> "Many things appear easy after they have been explained, and doubtless many a man has wondered why he failed to think of some apparently simple device or improvement that yielded a fortune to the one who did and revolutionized industry. The simple fact is that the average person sees things as they are, and he who has originality of vision enabling him to visualize defects and the means of overcoming them should receive adequate reward."

Invention sometimes resides in the discovery or appreciation of the difficulty with an existing device or art, even though the solution readily becomes apparent after the difficulty is understood. This was the situation in the cases of Miehle Printing Machinery Company v. Whitlock 223 Fed. Rep. 650 and Baltzley v. Spengler Loomis Manufacturing Company, 262 Fed. Rep. 423 in both of which cases the courts emphasized the fact that the mechanical changes themselves may be the least important part of an invention.

The courts have found it impossible to determine the presence of invention by applying the test of any general definition to the device under consideration. In one case it is possible to say that invention of a high order is present. In another case it is possible to say that there is lacking that intangible something which distinguishes invention from non-invention. The intangible something, however, cannot be segregated and defined so as to aid in the determination of the majority of cases, which lie in between the two extremes. Hence the courts have contented themselves by deciding individual cases on their own merits by means of a process of exclusion. As a result of the many adjudicated cases in which this process has been utilized there has grown up a set of negative rules, which are to be applied in given situations to determine whether certain variations in old devices and processes do or do not arise to the dignity of invention.

### Mechanical and Chemical Skill

The first of these rules is that it is not invention to produce a device or process which any skillful mechanic or chemist could produce whenever required. Any advance in the arts as results from this skill the public is entitled to avail itself of as a fruit of mechanical growth and advance.

The test is whether an ordinary person skilled in that particular art would spontaneously make the change represented by the invention. If he would do so there is no patentability. A person skilled in the art is a fictitious person supposed to know all that has been done in that field.

Examples of changes that have been held to involve nothing more than mechanical skill are as follows:—

1. Scallops or indentations on the inner surface of a steering wheel.

   Towne v. Lee 199 Fed. Rep. 777.

2. Reenforcing material in concrete.

   Turner v. Lauter 248 Fed. Rep. 930.

3. Flange on door to prevent rain coming in.

   E. G. Budd Mfg. Co. v. England Mfg. Co. 240 Fed. Rep. 415.

4. Making parts detachable.

   Elliott Machine Co. v. Rotschild. 235 Fed. Rep. 896.

5. Weighting knife bar of a roll paper cutter so as to obviate the necessity of pressing it down by hand when cutting off a sheet of paper.

   American Roll Paper Co. v. Weston 59 Fed. Rep. 147.

6. Placing two sheets of fly paper together with their sticky surfaces face to face, for convenience in handling and packing.

   Andrew v. Thum 67 Fed. Rep. 911.

If, after considering the alleged invention in the light of the prior art, the court is doubtful whether the change involves inventive or merely mechanical skill, it will invoke commercial success as evidence of invention. However, if there is no doubt in the mind of the court, commercial success is irrelevant and

will not be considered. This is so because the courts utilize commercial success to resolve a doubt in favor of invention and patentability and not to raise a doubt when none exists.

**Change of Size or Degree**

The second rule is that a mere carrying forward of the original thought, a change only in form, proportions or degree, doing the same thing in the same way by substantially the same means, with better results, does no constitute patentable invention.

As examples of unpatentable changes falling within this rule may be mentioned:

1. Increase in size of a machine.

Phillips v. Page, 24 Howard 164
Planing-Machine Co. v. Keith 101 U. S. 479
Edison v. Alsen's, etc. 219 Fed. Rep. 895.

2. Increase of strength or rigidity of a mechanical part. Thus in the Walker Manufacturing Company v. Illinois Brass Company 265 Fed. Rep. 279 it was held that the strengthening of a radius rod by means of a brace could have been thought of by a layman.

3. Operating a paper machine at higher pressure to produce a greater vacuum in the paper. Guardian Trust Company and Paper and Textile Machine Company v. Downington Manufacturing Company 29 Fed. (2nd) 887 in which patent No. 1,025,822 to Wm. H. Millspaugh dated May 7, 1912 was held invalid.

4. Doing something more thoroughly. Thus in the case of Continental Fiber Company v. Formica Insulation Company 287 Fed. 455 the court had this to say about a patent for laminated board *uniformly* saturated with a phenolic condensation product to form a *homogeneous* product:—"Neither skillful selection of material, nor thoroughness of workmanship, nor superiority of product constitutes in itself and without change of method or novelty of use patentable invention."

5. Changing proportions of ingredients. Thus in Brady Brass Company v. Ajax Metal Company 160 Fed. Rep. 84 a mere difference in the proportions of the constituents of an alloy was held not to involve invention.

Exceptions to the rule are made when the result is disproportionate or unexpected. Thus in the case of Kuehmusted v. Farbenfalbriken of Elberfeld Co. 179 Fed. 701 the court held that the reduction of the amount of impurities in aspirin, which in its impure form had long been known to chemists, whereby a deleterious substance was converted into a valuable medicine, was not merely a change in degree, but a change of kind, producing a new substance.

Another notable exception to the rule was made in the case of Eibel Process Company v. Minnesota and Ontario Company 261 U. S. 45. The evidence showed that the Fourdrinier machine for making paper had for many years been well known and most widely used for making news print paper. By improving the stock and by strengthening the parts the speed of the machine had been brought up to between 500 and 600 feet per minute. But when this speed was attained and maintained for any length of time, the operation showed defects in the paper, described as waves and ripples, which were only overcome by a reduction of speed to less than 500 feet per minute. Eibel's invention was to enable the paper maker to increase the speed to 600 or 700 feet and even more and still produce a good product. To do this he increased the pitch of the wire at the initial point from 15 to 24 inches, giving the stock the added force of the down hill flow, and increasing the speed of the machine to correspond, so that the speed of the stock and the speed of the machine were increased cooperatively to from 600 to 700 feet, reaching this efficiency by experiment and actual trial.

One of the claims in the Eibel patent that were sustained reads as follows:

"Claim 1.

A Fourdrinier machine, having the breast roll end of the paper making wire maintained at a substantial elevation above the level, whereby the stock is caused to travel by gravity rapidly in the direction of the movement of the wire, and at a speed approximately equal to the speed of the wire, substantially as described."

**Substitution of Material**

The third negative rule is that it does not involve invention to substitute superior for inferior materials in making one or more parts of a thing, unless the substitution involves a new mode of construction, or develops new uses and properties of the article not obvious from the change, or where superiority of the substituted article is shown to consist not only in greater cheapness and durability, but also in more efficient action.

Among the many illustrations of this rule may be mentioned:—

1. Making paving blocks of wood instead of stone as heretofore.

Brown v. District of Columbia 130 U. S. 87.

2. Making noiseless gears out of Bakelized paper or canvas instead of hard fiber.

Westinghouse Electric Co. v. Formica Insulation Co. 272 Fed. Rep. 667.

3. Substitution of sheet metal for cast metal as the material for roller skate trucks.

Union Hardware Co. v. Selchow 112 Fed. Rep. 1006.

4. Substitution of paper for hard fiber in the lining of an incandescent lamp socket.

Marshall v. Pettingell-Andrews Co. 164 Fed. Rep. 862.

5. Substitution of laminated paper united with fused cement for walls of a vessel.

American Can Company v. Mulkey Salt Company. 264 Fed. Rep. 977 involving Harbeck Patent No. 1,062,002 dated May 20, 1913.

It is interesting to note that the Patent Office refused to grant the Harbeck patent for lack of invention, but was overruled by District of Columbia Court of Appeals in the case of In re Harbeck 1913 C. D. 405.

The following examples illustrate the exceptions to the rule:—

1. Substitution of wooden blocks for iron blocks, resting in oil for supporting rim of saw carriage. The wooden blocks by capillarity, supplied oil to the bearing surfaces, whereas in the case of iron, an independent means was necessary to supply the oil.

Perkins v. Interior Lumber Co. 51 Fed. Rep. 286.

2. Substitution of tungsten for carbon in lamp filament.

General Electric Co. v. Laco Phillips 233 Fed. 96.

3. Substitution of celluloid for metal for salt shaker top where it appeared that the celluloid unlike the metal resists oxidation, can be adjusted on account of its flexibility to irregular shaped vessels and insulates the salt, thus preventing it from caking.

4. Substitution of a thin highly porous sheet of Yoshino paper coated with paraffin for ordinary paper coated with hard wax for stencil or mimeograph paper. The Yoshino paper has sufficient porosity to permit transmission of the ink while the soft paraffin is easily displaced by a writing instrument, as a result of which perfect reproduction of the loop letters was made possible for the first time.

A. B. Dick Co. v. Fuerth 57 Fed. Rep. 834.

**Duplication of Parts**

The fourth rule is that it does not constitute patentable invention to duplicate one or more parts of a device. Thus in the case of Slawson v. Grand Central R. R. Company 107 U. S. 649, it was held unpatentable to place two glass panes in a fare box so that both the conductor and passenger could see the amount. For the change produces merely a duplication of the old result.

An exception to this rule is made when the duplication of parts modifies the old result in an entirely unexpected manner or produces a new result. Thus in the case of Goss-Printing Press Co. v. Scott 108 Fed. Rep. 253 it was held patentable to bank one printing press upon the other, since the two when so combined, and in their new relation, so coacted as to dispense with angle bars, as well as with a web-deflected course, and made possible a straight-line duplex press.

### Omission of Elements

The fifth rule is that it is not invention to omit one or more parts of an existing thing, unless the omission causes a new mode of operation of the parts retained, or results in a substantial simplification of construction or rearrangement of the remaining elements whereby the same or a better result is obtained by a less number of parts. Obviously if a man discovers that he can eliminate one or more parts of a machine or process and still get the old result, he is entitled to patent protection. But if the omission of the element also eliminates the function of the omitted element and does nothing more, no patentable invention is present.

### Making Device Portable

The sixth rule is that it does not constitute patentable invention to make an old device portable. The advantage and convenience arising from making a device portable are usually so obvious that their perception and appreciation cannot be held to involve an exercise of the inventive faculty. However, in a very small percentage of cases, it happens that the change brings about new and unexpected results. In such a case the change may be patentable.

### Substitution of Equivalents

The seventh role is that no invention is involved in substituting equivalents in an old device or thing. An equivalent is usually defined as an element that performs the same fuction, in substantially the same way to produce substantially the same result as that produced by the element replaced. Terms and nomenclature do not determine the question; neither does form or shape.

1. A bolt and a screw were held to be equivalents in Root v. Sontag 47 Fed. Rep. 309.

2. Ball bearings and roller bearings were held equivalents in Coates v. Boker 119 Fed. Rep. 358.

3. A crank is usually considered equivalent to a cam or an eccentric.

4. A chain and sprocket are equivalent to a shaft and a pair of gears.

5. A spring and a weight are equivalent for pulling down but not equivalent for absorbing vibrations due to the difference in the manner of producing the result.

6. In the case of Machine Company v. Murphy 97 U. S. 120 the Supreme Court held a knife that fell by gravity and cut the paper to be the equivalent of a stationary knife that was made to cut by the fall of a device that had no other function than to fall on the paper at the proper moment to cause the cutting. The suit involved Patent No. 24,734 for a paper bag machine.

### Change of Location

The eighth rule is that no invention is involved in merely changing the relative location of parts of an old device.

As examples of changes of location that were held unpatentable may be mentioned:—

1. Changing the angularity of two shafts which are operatively connected by gearing.

2. Location of reenforcing members in a bridge. Ex parte Lute 1917 C. D. 34.

3. Reversal of parts such as placing cutting knife behind instead of in front of moistener. National Binding Machine Co. v. Harper Paper Co. 242 Fed. Rep. 939.

4. Reversal of parts such as making the type bed stationary under traveling cylinders, instead of making the cylinder stationary and the type bed movable under it. Duner Company v. Grand Rapids R. Company 171 Fed. Rep. 863.

If the change in location is not merely arbitrary, but is accompanied by some unexpected or unobvious result, the courts will uphold the patent. Thus in the case of Grever v. U. S. Hoffman Company 202 Fed. Rep. 903 it was held that Hoffman in his pressing machine had exercised the inventive faculty by applying the steam to the surface of the coat from above instead of below as in the prior art. For, when the steam is applied from the below, several thicknesses of cloth must be saturated and the drying is delayed, while in Hoffman's device only the outer surface is moistened.

Another notable case in which the change in location of elements of a device was held patentable is Hoyt v. Horne 145 U. S. 302. In that case it appeared that prior to Hoyt's patent No. 303,374 dated August 12, 1884, rag engines were usually constructed with a vertical midfeather. Hoyt found that by placing the beater roll in one end of the vat and providing a horizontal midfeather extending from the beater roll to the other end of the vat, an unexpected increase in beating action was obtained, in that the fibrous material and liquid were carried from the lower section between the knives and delivered over the top of the beater roll into the upper section.

### Making an Element Adjustable

Rule 9 is that it is not patentable to make an element adjustable, if no unexpected new result is produced by the change. Thus in the case of Houser v. Starr 203 Fed. Rep. 264 it was held not to constitute invention to make a tool adjustable in four directions instead of two.

The tenth rule is that there is no invention in making two parts integral that had previously been separate and vice versa, unless the new integral part, or the separate parts perform some new or additional function that is unobvious from the change. It has been held that an increase in strength is not such an additional function as to create an exception.

### Double Use

The eleventh rule is that the application of an old device or process to a similar or analogous subject, with no material change in the manner of applying it, is not patentable even if the new form of result has never before been contemplated.

This rule, often referred to as the rule of double use, is tied up with the question of analogous art. A man is expected to know of a solution in his own and analogous arts, but not in remote arts. Hence it may involve invention of a high degree to take over a device from an entirely unrelated art and apply it to produce a different result, even if no material change is made in the construction.

Illustrations of cases in which the adaptations were held to be mere double uses are as follows:

1. Punching metal and punching paper. Conley v. King Bridge Company 175 Fed. Rep. 79 in which the court said that a man would naturally consider machines in other arts adapted for punching materials of like form.

2. Coffee mill and mill for grinding spices.

3. Applying ice cream freezer to preserving fish. Brown v. Piper 91 U. S. 37.

4. Lifting sheets of paper by suction when it was old to lift buttons, pills and nail heads in that manner. F. R. Sterns Co. v. Russel 85 Fed. Rep. 218.

5. Applying process of coating paper, metal, fabric, glass, etc. to shoes, since the operation was merely coating. In re Braselton 273 Fed. Rep. 759.

6. Transfer and adaptation of a machine for coating glass and emery paper to the art of coating paper with gelatin emulsion for photographic use. Eastman Company v. Getz 84 Fed. Rep. 458.

Some cases in which the new adaptation was held to be more than a double or analogous use and hence patentable are as follows:—

1. Cylinder for polishing wood and cylinder for disintegrating clay. Potts v. Creager 155 U. S. 597.

2. Torsional spring used in clocks, doors, etc., applied to telegraph instruments. Western Electric Company v. La Rue 139 U. S. 601.

3. Grinding buttons and grinding lenses. Bisight Focal Company v. One-piece Bifocal Lense Company 259 Fed. Rep. 275.

4. A drier felt and other fabrics such as carpets and machine belting. Barrell v. Fitchburg Duck Mills 214 Fed. Rep. 777 in which case the following claim was upheld:—

"A drier felt for paper machines consisting of two superposed plies of double-face woven fabric, having large face-warp, said plies being united by smaller binder-warps adjacent the under or inner sides of the facewarps, and buried under the said face-warps of the plies, substantially as described."

In many cases it has been held that the necessity for considerable change in the old device to adapt it for its new purpose is evidence of invention. Thus in the case of Potts v. Creager supra the fact that the wood polishing machine had a series of peripherially extending glass strips or bars which had to be replaced by steel bars to produce an operative clay disintegrator was the decisive point.

The argument that considerable change was necessary to adapt the old device to its new use was relied upon in the case of Eastman Company v. Getz mentioned above. In this case it appeared that to adapt the glass coating machine to coat paper it was necessary to increase the distance between the coating and driven rolls to give more time for the drying and setting of the gelatine emulsion. The court, however, held this charge to be one that would naturally occur to a skilled mechanic when confronted with the problem of applying an emulsion of a different consistency from that formerly employed.

### Combination and Aggregation

The twelfth and last negative rule is that aggregation or lack of combination is not patentable. Restated in non-technical language, the component parts or elements of a device or process must coact with each in such a manner as to produce a unitary result which is not merely the aggregative effects of the individual elements.

When operations or devices are brought together and united, one or the other of two results must follow. Either each element remains unchanged in function or effect, or each one performs additional functions and produces additional effects due to their action upon each other or their joint action upon the common object. The former union is an aggregation or a mere collocation of elements and is not patentable.

As examples of aggregations may be cited the following cases:—

1. Eraser and lead in a lead pencil. Reckendorfer v. Faber 92 U. S. 347.

2. Two machines on a single bed plate for performing successive operations on a single piece.

3. Plurality of tools on a turret head of lathe for tire making. Firestone v. Seiberling 257 Fed. Rep. 74.

4. Adding a second lock to bag already having one lock. Wertheim v. Lefkowitz 232 Fed. Rep. 474.

5. Washing Machine and wringer both operated by same motor. Grinnel Washing Machine Company v. Johnson Company 247 U. S. 426.

6. Library paste jar divided into compartments, one for paste and one for water.

7. In the case of Bagley & Sewall Company v. Empire Wood Pulp Company 58 Fed. Rep. 212, Patent 393,538 to Campbell was held invalid on the ground of aggregation. This patent disclosed a wet machine for sheeting wood pulp in which there were two distinct types of adjusting means for the ends of the guide rollers for the purpose of facilitating the adjusting of either end of the felt without interference with the tension of the other end. The court held that there was no patentable combination between the two types of adjusting means, since each one operated separately and neither modified the action of the other.

If several elements are brought together so that additional functions are performed and additional effects are produced, the union is a true patentable combination. In such a combination the final result is unitary and due to the joint coaction of all the elements. It is not, however, necessary that all the elements operate simultaneously so long as every one of them contributes to the unitary result. They may operate successively. Nor is it necessary that all the elements coact or cooperate with each other all the time, as long as they do so part of the time to produce a new and useful result in an improved and modified manner. In any event the result must be more than that of the separate elements, and the combination of elements in correlation must produce a different force, or effect, or result, from the sum of that which is produced by their separate parts.

An excellent example of a true combination is the process described and claimed in Patent 1,316,120 to Sutherland, which was held valid in the decision of Michigan Carton Company v. Sutherland Paper Company 29 Fed. Rep. (2nd) 179. The method calls for sealing waxed cartons by dewaxing, gluing and pressing the surfaces together. This process was held patentable though each one of the steps was individually old. The invention consisted in bringing them together so that they cooperated to produce a new and unitary result.

Thus we see that a new and patentable combination may be produced by bringing together a number of old elements. Another illustration of this is the naphthaline paper patent to Tsheppe which has already been discussed. Both the paper and the naphthaline were separately old—but nobody prior to Tsheppe had applied two or more coatings of naphthaline to a sheet of paper to produce a paper having a compact, porcelain-like appearnce.

A new and patentable combination may also be created by rearranging the elements of an old combination. This was the case in the Hoyt patent already referred to, in which the patentee rearranged the beater roll and the midfeather in the vat to produce a new rag engine.

It often happens that the elements themselves are new and patentable. In such case patent protection may be secured on both the combination and on each of the new elements. However, it must be emphasized that if a new element is introduced into an old combination, a patent cannot be secured for the combination unless the new element coacts with the remaining elements in a different manner than did the replaced element to produce a modified or different effect. In other words improving merely one element of a combination does not ordinarily create a new combination in a patentable sense.

Such was the case in American Box Machine Company v. Day 29 Fed. Rep. 585 in which the defendant sought to avoid a charge of infringing Patent No. 298,879 for a box covering and trimming machine by pointing out that his pasting roller was a great improvement over that disclosed by the patentee. The court held and rightly so that the combination was not changed by improving one element, since the elements of the alleged new combination were combined and operated in substantially the same manner as in the old combination.

### Summary

From what has already been said, it may be laid down as a general rule that an invention or discovery is patentable, if it relates to patentable subject matter and produces an unobvious or unexpected result or an old result in an improved and unobvious manner. Several illustrations of what the courts consider an unobvious result in paper making have already been given. Another excellent illustration is contained in the hard fought case of American Sulphite Paper Company v. Howland Falls Pulp Company 80 Fed. Rep. 395 (1895) involving Reissue Patent No. 11,282 to Russell for a cement-lined iron shell for carrying out the sulphite process.

In this suit it appeared that it had long been well known that bisulphite liquors attack hydraulic cement quite freely at ordinary temperatures, but no one prior to Russell's application for patent knew that the bisulphite liquors have no action at all on the cement at the high temperatures at which the sulphite process was carried out. Further that if original defects exist in the cement lining they become filled up in use and such liquor as may work its way through a crack is rendered harmless through reaction with the lime salts of the cement. The court therefore held that the result was an unobvious and unexpected one and upheld the patent.

# The Beater Method of Evaluating Pulp*

By H. A. Rothchild, A. Ely and F. Poppe[1]

The beater method for testing sulfite pulp has been in use in our laboratories for 11 years and, without going into the various phases of development during this time, I will briefly describe the equipment, the procedure of testing and the interpretation of results.

The test is used almost entirely as a control test on the sulphite cooking, the purpose being to produce an absolutely uniform sulfite pulp of definite strength requirements for the paper mill. Our requirements being rigid and our control active at all times, to the extent that pulp can not be used or a car of the pulp shipped to another mill until the test results show it is suitable for the paper to be made, the testing operation must be routine and continuous. Each sulfite mill has its own strength testing laboratory, which operates 24 hours a day, or as long as cooks are being blown, and each cook is sampled from the wet machine or decker and immediately tested so that within an hour and a half after the sample is taken, the sulphite superintendent is informed of results on the pulp tested, and he can use these results for regulation of following cooks.

## Equipment

The testing equipment used consists of a 1½ pound laboratory beater with controlled bed plate, a sheet mould and couching roll, an hydraulic press and pump, a steam drying plate, a paper trimmer, a conditioning oven and balance, and a mullen pop tester. This equipment is not of our own build but is standard laboratory equipment, most of which we obtained from the Valley Iron Works of Appleton, Wisconsin. A detailed description of the equipment is hardly warranted, so only a few comments, which experience has indicated are important, will be given.

The roll of the beater should turn at 500-525 revolutions per minute, the lever arm should work freely, with the least possible friction, so that practically no effort is needed to bring the bed plate in contact with the roll. No play should exist in the beater roll bearings or in the bearing of the bed plate lever arm, and the beater roll should make uniform contact over the entire area of the bed plate knives. In brief, the beater must be kept in good mechanical condition to obtain consistent tests, just as a full sized mill beater must be in good mechanical condition to obtain consistent beating in any mill beater room.

## Sheet Mould

The sheet mould is equipped with 90 mesh wire and has a deckle area 6 inches x 6 inches. Suction is applied by means of a water leg 85 inches in length from the wire to the outlet. The outlet of the water leg is controlled by an inch and a quarter quick opening valve, so that in operation the drainage rate is close to 400 c.c. per second.

The couching cylinder of copper has a surface width of 8 inches, an outside diameter of 6.5 inches and is equipped with a 1 inch piece of solid shafting 14 inches long, soldered in the end plates of the cylinder and acting as a handle. The total weight of completed cylinder is 21-22 pounds.

The drying plate is made of brass, steam heated, with hinged cover. The steam box of the drying plate is kept water free and at atmospheric pressure by continuously bleeding steam from the discharge steam connection. The cover of the drying plate is equipped with two thicknesses of canton flannel and is down when not in use. The flannel is to fit the cover perfectly smooth, be clean and not torn.

The conditioning oven may be described as a rough analytical balance, one pan of which is enclosed by a drying oven, so that the test sheet may be weighed bone dry without removing from the oven. The temperature of the oven at the balance pan is maintained at 100-105 deg. C.

## Operation

The sample of pulp to be tested is brought up to the testing laboratory, and an amount equivalent to 275-300 grams (a. d. basis) is weighed out. The tester soon becomes adept at judging the approximate moisture test of the sample of pulp and weighs out the wet sample according to his judgment of the consistency. We find that this is entirely satisfactory and avoids the delay of making consistency tests.

The beater is filled with 18 liters of water and the beater started with the bed plate and roll out of contact. The weighed pulp sample is then slowly added to the beater and temperature adjusted by means of live steam at 35 deg. C.

Immediately after the temperature has been adjusted, place weights on the lever arm of the bed plate, which brings same into contact with the roll. Sufficient weights are added so that the maximum strength is developed in 50 to 70 minutes when ordinary wet sulfite is being tested, or in 80-90 minutes when dry sulfite or kraft is being tested.

Note the time of placing weights on lever arm and after twenty minutes of beating, make the initial sheet, then continue to make sheets at regular intervals until four or more sheets have been made: that is, until the maximum point has been passed No doubt should exist that this point has been reached, inasmuch as the last sheet should show a decided drop of two points from maximum.

## Sampling Stock

A small measuring cup of about 100 c.c. capacity is used for removing enough stock from the beater to make the test sheet. The sample of stock for test sheet is removed while beater is running.

Always take pulp sufficient for two sheets at each interval, so that if one sheet is spoiled another may be made. Whenever it is unnecessary to use the second cup of stock, do not put it back in the beater, but treat it as waste. The best way to regulate the amount of stock to be taken for sheet making, so that the dry and trimmed sheets will be uniform in weight and will approach closely the set standard of one gram, is to observe the weight of the sheets when dried and cut to the size of 5 inches x 5 inches and regulate the amount of stock thereby.

## Sheet Making

Place the sample taken in a copper cup container of four liter capacity, dilute it with a stream of clean, filtered water to exactly the three liter mark, and then stir it vigorously by means of a metal paddle or stirrer for one-half minute, as timed by a sand glass. The copper cup used for diluting purposes has an inside diameter of 6 inches and a height of 10 inches. Immediately pour the stock after mixing into the assembled sheet-making apparatus in a manner which prevents circulating currents by pouring the stock in no definite spot, but by constantly moving the cup back and forth. The next step is of vital importance. It is essential that as soon as all the stock has been transferred, open instantly the quick opening valve so that no delay occurs to give the stock any time to settle. Allow suction to continue for five seconds after all the water has disappeared. Then lift the heavy iron deckle box or swing it up out of position. The square rubber

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gasket of soft texture is first carefully cleared of any excess water by means of the fingers and then carefully removed so that no drops of water can possibly fall on the wet uncouched sheet.

The sheet is then couched off, using a smooth surfaced felt and an 8 inch diameter couch roll. The couching felt is laid on the sheet, and pressed against the sheet by rolling the couch roll across and back. The front end of the felt is then held against the couch roll, and after first noting that contact has been made between the sheet and felt, the couch roll, felt and sheet are rolled back, thus couching the sheet.

Cover the couched sheet with one piece of felt, cut exactly 7 inches x 7 inches, and known generally as a first felt. This felt is soft and of rather open texture to allow for the rapid absorption of water. Then insert the two felts with sheet in the hydraulic press and press it for one minute, keeping the gauge pressure constant at 75, which is equivalent to 82 pounds per square inch of felt surface, cut 7 inches x 7 inches. Release the pressure and as soon as the cover works free, lift it, then close the press outlet valve at once. Remove the pressed sheet from the felts by carefully loosening one corner of the sheet, pulling diagonally and in such a manner that the sheet "comes clean" from felt. Dry the sheet as follows:

### Drying the Sheet

Place the sheet smoothly upon the hot plate and carefully lower the cover, then immediately raise it. Then reverse the sheet surface and lower the cover and raise exactly as before. Repeat once more for each side, as described above after which the cover is allowed to remain for longer intervals of time, three to five seconds. Continue and reverse the sheet until it is completely dry. Make sure that all sheets are sufficiently dried by subjecting them to a little longer drying period rather than not long enough. By not allowing the cover of the hot plate to rest upon the wet sheet at the start of the drying period for more than an instant and by keeping the brass plate polished one can prevent the sheet from sticking to the hot plate and consequently prevent the fibres from pulling away from the sheet. In this drying process do not pound the sheet with the cover at any time, nor allow the cover to fall hard. Always lower the cover carefully. If the sheet sticks to the hot plate, polish the brass plate with fine emery cloth.

After complete drying, trim the sheet to the exact size of 5 inches x 5 inches. This is very important because the basis weight of the sheet depends directly upon the size of the sheet cut. In trimming eliminate as far as possible any visible defects and trim the sheet square. After trimming it, place the sheet in an oven maintained at 100-105 deg. C. and allow it to remain there for three minutes or until it has reached constant weight. As soon as the weight is constant, record same, then remove from oven and pop it immediately for it adsorbs moisture quickly causing variation in results. The operator must work quickly to pop the sheet when once removed from the oven. No delays are to occur. The sheet must be popped in less than thirty seconds and can be in twenty if the Mullen tester is working properly. Make five pops one in each corner, and the other in the center. Record the five pops for each sheet, average them, and correct the average to the standard weight of 1.00 gram, by dividing it by the actual weight of the sheet. Record individual pop tests to the nearest whole number.

Plot the corrected pop test against the time in minutes at which the sample was taken from the beater. Draw an average curve through these plotted points and from the highest point on the curve corresponding to the highest test obtained take the maximum strength reading.

### Precautions

Experience has taught us that numerous precautions must be taken in continuous operation of the test, such as cleaning of wire on sheet machine regularly to avoid pitch and dirt, and running felts through an ordinary clothes wringer before couching and pressing of each sheet. It is, of course, also understood that the usual precautions of care and operation of the Mullen pop tester are observed.

In the routine use of the test as we have outlined it, the same operator using the same equipment will check himself exactly or within one point pop on the test sheet, which has a basis weight of 45 pounds (25 x 38 — 500). Different operators in different mills will check within two points when given the same pulp.

As in all laboratory or mill equipment, there are numerous things that may get out of order with the beater, the sheet machine, pop tester, and everything else used. We have 6 experimental strength beaters in continuous use at various mills and to keep this equipment checked up and in shape at all times, the central office sends out a sample of pulp to all mills at frequent intervals. The central office knows the strength test of this pulp but the receiving mill does not. Each operator in the receiving mill tests this sample and reports back to the central office, and the results received give us information on the work of individual operators as well as the functioning of the equipment. If test results returned to the central office are out of line, the superintendent at the particular mill is notified and he investigates the trouble and brings the testing equipment or operators back into line.

### Interpretation of Results

In any routine control test, the interpretation of results eventually boils down to setting a standard test for each grade of pulp produced, which test the sulfite mill must meet for that grade. The eventual value of the test then is a warning signal to the sulfite department that their pulp is, or is not, up to standard strength test and if it is not up to standard they must look to the various details of their process for the reason why.

We do not intend to convey the impression that a maximum strength test will give all the information necessary for evaluating pulp for paper making. We use the bleachability test extensively in connection with the maximum strength test. For special investigations we use the constant humidity room and make tear, tensile, stretch, fold and numerous other tests on hand sheets made by various methods according to the nature of the investigation.

Many of these other tests have also been investigated for their practicability on a routine control basis. Theoretically the initial strength test seems more logical as a control basis for a mill where the pulp is slushed and not beaten. The ball mill or rod mill, as laboratory equipment, would seem to be easier to keep in perfect operating condition than the beater. Several articles have appeared in recent literature recommending the use of tear and tensile instead of Mullen pop test. The logic and theory of these other tests has appealed to us as it has to many others and from time to time in the past we have tried out all of them. We believe that the proof of a test is in its use and application, so our method of trying out another test was to put it on a routine basis for a period of two months and watch its value to the pulp and paper mill. The usefulness of any test depends on its ease in interpretation in the pulp mill or its ease in being converted into a standard for the pulp mill, the speed with which test results can be obtained and the reliability of the test when performed by non-technical men. Generally speaking, we have found that all of the methods and tests which we have tried out give similar information if properly interpreted. Judging each method by its usefulness and the factors which go to make up usefulness as cited above, we have always come back to the beater maximum strength procedure for routine control.

We run about 10,000 beater maximum strength tests yearly on a routine basis. As you can realize, this routine experience has built up more facts, factors and precautions than it would be possible to enumerate in this paper. We believe, however, that the above outline will give a general idea of how the beater method is used for control.

# Domestic Clays For Filling and Coating Paper*

By Olin W. Callighan[1]

The purpose of this paper is to bring before the paper industry facts regarding domestic clays now being used as a filler in the loading of paper and as a material for surface coating paper.

American paper clays are secondary (or transported) in character, meaning that they have been carried some distance away from their point of origin; they offer advantages in formation of grain, size of particle, purity, etc., that cannot be obtained in any foreign clay. This is partially due to the purity of the ground over which the shifting and weathering took place, and also to the fact that American clays are much older than any foreign clays.

As it will be necessary for the writer to refer continually to the company with whom he is connected, and, as far as he knows, is the only producer of an American clay suitable for both loading and coating all the different grades of paper made, he hopes, he will be pardoned for these references.

### History of Clay Production

As far back as 1875, in order to remove what impurities had accumulated during the transporting of these clays, numerous washing plants were erected for this purpose in the southern sections of this country. The first successful washing plant to purify American clay suitable for a filler in paper making was located in the South Carolina territory.

Being the pioneers in the washing of domestic clays for the pottery and allied trades, and to meet the demand for a domestic clay for paper, Edgar Brothers Company started washing operations at McIntyre, Georgia. This was in 1910, and it has taken up to the present time to improve these clays to their present state of uniformity. Our present "H. T." coating clay, and "Super Klondyke" filler clay still comes from this same territory. From actual boring tests there is enough clay in evidence at this mine to last over a period of approximately 75 to 100 years, should our present capacity of 150,000 tons per year be taxed to the limit.

The investment at this mine runs well over a million dollars in washing and treating equipment alone, and while we had felt for some time that the limit of purifying these clays had been reached, surprising results have been obtained lately by adding new machinery, readjusting treatments and by experiments and research.

Today, we are supplying clay that is used as a filler in paper, covering all the grades from newsprint to bonds; as a surface coater for coated book, litho, card board, and glazed finish papers. In other words, we are substituting domestic clay for imported in all grades of paper made.

It is not only through the demand from the paper manufacturer that the use of domestic clays has increased, but the paper merchant also is requesting its use in his stock lines, and contract papers. The paper jobber has come to realize that the superior qualities of our American clays are essential in good papers today.

### Paper Making Prejudices

Numerous prejudices on the part of the paper maker had to be overcome before much of this progress could be made, and it was through the encouragement of several of the larger paper producers that modified methods of preparation were adopted, resulting in producing a clay of lower grit content, lower moisture and greater uniformity than any other clay produced in the world.

With these points in our favor, the next problem was to convince the rest of the consuming trade of these features, and secure trials for our clay in their product. Once these trials were obtained, and the superior qualities proven, American clays were accepted.

As already explained, American clays are somewhat different in character, and before the transition from English clay to domestic clay could be effected, a great deal of experimenting had to be done, to prove that by the use of American clays savings in costs, as well as improvement in paper products would result. These advantages with regard to loading and coating will be explained in detail later in this paper.

### Loading or Filling

Domestic clays can be added to the beaters either dry or in slip form. A few mills still find it profitable to buy their filler clay in 50 pound paper bags, and furnish direct to the beaters from these bags. There are a few arguments why this is not altogether good practice:

First: If any coarse particle, or foreign matter should find its way into the clay, or the bags, it would be dumped into the stock furnish, and eventually spoil considerable paper.

Second: It is common practice for the clay producer to make an extra charge per ton for putting the clay into bags, and to cover the cost of these bags.

Third: There are few small mines in the south that have a crude clay of such purity that no washing is required, but it must be pulverized to diminish the size of the grit particle. This clay must be pulverized and put up in bags. The output of these mines is small, and mills that formerly used this grade of clay find it of considerable saving now to buy washed clay in bulk that is free from grit, and save themselves the cost of pulverizing which amounts to $2.00 per ton and having the clay put up in bags at $2.00 per ton.

If it is necessary to have clay delivered in paper bags there surely is no reason for pulverizing a grit free washed clay when modern methods of preparation will disintegrate the clay to the size of a pea. With a clay this size, no difficulty should be encountered in breaking it down in the beaters or mixers.

Some mills feel that a double kraft bag, such as is used for shipping clay, is worth around 3 to 4 cents per pound. Of course, these mills must be using kraft as a part of their furnish, or in other grades in which sulphate pulp can be substituted in order to use these bags.

The general opinion is that clay added to the beaters in slip form is most economical and offers numerous advantages.

These advantages are: (1) Cost of bulk clay cheaper than clay in bags. (2) Operating costs lower. (3) All of the clay can be run through a screen before it goes to the beaters, or becomes a part of the paper furnish, insuring against any foreign matter entering the beaters by way of the clay. (4) More accurate control from clay bin to beater can be maintained. (5) Pneumatic and suction unloading devices can be installed to unload the clay in much less time, thereby resulting in considerable labor saving.

In using the slip method of adding clay to the beater, the thinner the clay slip is, and the longer it can be agitated, the better it will be. This is particularly true of most domestic clays where the clay has been filter pressed and dried to 2 or 3 percent moisture, and where no deflocculating agents (sodium

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[1] Member TAPPI, Chemical Engineer, Edgar Brothers Company, Metuchen, N. J.
Note: Analytical methods supplied by Dr. Heinrich Ries.

carbonate, sodium silicate, alum, etc.) have been used in the washing process. Complete dispersion does not take place until the maximum agitation is given to the clay. This should be determined for each clay used. By lengthened agitation of domestic clay there will be fewer lumps to screen out, it will screen more rapidly and much more easily, a finer mesh lawn for screening can then be used and it will flow better through the pipes.

A convenient strength of slip for furnishing to a beater is made by adding one ton of clay to a tank holding a ton of water. This will give a pound per gallon slip. Never use a slip of over two pounds per gallon, because above that figure, difficulty will be experienced in making the slip flow or be pumped to the beaters. By the strength of slips mentioned above it is easy to gauge the amount of clay being furnished to the beaters.

Hot water should be used, when possible, in making up the slip as it slacks the clay more readily than cold water, especially in cold weather; it also gives the clay a greater chance to break down to form a perfect suspended mass which will give much higher retention of the clay in the paper.

Some mills find it of advantage to run domestic clays through a centrifugal pump before running the slip to the storage tanks. The pumps help to churn out the small hard lumps and also aid in making a perfectly suspended slurry that will flow and screen well.

### Influence of Electrolytes

Due to the plastic nature of our domestic clays, it might be well to mention the influence of electrolytes on their suspension and deflocculation. It has been proven that the settling time of this clay slip can be controlled, within certain limits, by addition of electrolytes and peptizing protective colloids. Sodium silicate, caustic soda, sodium triphosphate, indeed assist in the suspension of the clay. The amounts to use would of course have to be determined for each local condition; because amounts beyond the optimum concentration produce a lesser effect or cause the flocculation of the suspended clay. A unit of sodium oxide as sodium silicate has a greater effect in reducing the viscosity of domestic clay slip than the same amount of sodium oxide added either as hydroxide or carbonate. The silica must enter into the reaction and it appears that a study of the various types of silicate with different ratios of $Na_2O : Si O_2$ would greatly aid in determining the correct one to use. The hydrogen ion concentration is certainly an important factor in the effect of electrolytes on clay suspensions; the different types of alkalies mentioned above offer a wide range for securing the best for the manipulation of each particular clay and by the use of either it should be easy to control the characteristic of each clay.

Domestic filler clays offer to the paper manufacturer the following superior qualities:

(1)—Greater Retention of Clay in the Sheet. We have in our files comparative figures showing from 10 per cent to 20 per cent increased retention by the use of our clay over any other domestic or imported clay. Of course, we realize that numerous factors influence the above figures, such as: Pulp furnish, length of beating time, hydration, time of adding clay, control of other chemicals added, white water recovery, grade of paper, weight, speed, mesh of wire used, etc.

(2) Opacity: Due to the density and fineness of particles, domestic clays give paper much higher opacity. It is remarkable to note that since the public printer added the opacity test to much of his printing paper requirements, we have received many repeat orders for domestic clay. As high as 3 points increase in opacity have been reported by certain mills using domestic clay.

(3) Finish: Domestic clay gives to paper a much higher finish than any other clay. On a recent test run in a mill formerly using imported clay, it was necessary to remove all the weights from the calenders to prevent blackening and still the finish was 13 per cent better when domestic clay was used. We believe the reason for this is due to the fact that the size of particle of the domestic clay was much finer, besides having greater covering power on the fibers themselves.

(4) Moisture: Considerably more moisture can be maintained and carried in paper loaded with domestic clay because of its greater covering power, therefore requiring less calendering to secure equal finish. With other clays more calendering is necessary to secure the desired finish, resulting in a blackened sheet if the paper contains much moisture.

(5) Plasticity: Due to the plasticity of domestic clays, it is possible with their use to load to a greater extent, papers requiring a hard surface, namely: offset, super litho, coating rawstocks, etc. because this quality tends to make the fibers knit together, preventing fuzz and rough surfaces.

(6) Other Advantages: Besides the above mentioned advantages there are several others of no less importance, such as: better feel, pliability, printability, and permanency. In all of these points domestic clays are showing up favorably. Domestic clay contains 10 to 12 per cent less moisture than any other paper clay. Averages over a period of three years (500 cars) on clay shipped to mills in different sections of the country show a moisture content of 3 per cent. This saves the consumer considerable cost in freight on the clay from mine to mill. Domestic clay runs much lower in grit than any other clay; averages around 1/10th of 1 per cent have been repeatedly confirmed in paper mill laboratories.

Inventories are greatly reduced because imported clays must be taken from the boats as they dock, or soon after, while domestic clay producers, maintain vast supplies at the mines, where shipments can be gauged on delivery time from mine to mill.

Following are a few definitions and tests: We believe that by their study, and as a basis for comparative tests between one clay and another, it will be very easy to determine the superior qualities of certain American clays.

### Mechanically Combined Water in Clay

This includes that which is held in the pores of the clay by capillarity. It may include water of plasticity, shrinkage water, and pore water. Water of plasticity is that which is driven off when the clay is dried from a condition of maximum plasticity to 110 deg. C. Shrinkage water is that which passes off when the clay is dried from the condition of maximum plasticity, to the point where shrinkage practically ceases. Pore water is that remaining in the pores of the clay after shrinkage has ceased, but is driven off at 110 deg. C.

It will be seen that the water of plasticity is equal to the sum of the shrinkage and pore water. A high percentage of shrinkage water often indicates a fine-grained clay which may give a strong body when dry, while a high pore water content may be characteristic of a clay which when dried exhibits a weak porous structure.

Clay is very hygroscopic, and when thoroughly dried it readily absorbs moisture from the atmosphere, in fact, it may sometimes absorb as much as 10 per cent of its weight. When water is added to a dry clay, the volume of the plastic mass exceeds the sum of the volumes of the clay and water, by from 1 to 5 per cent, and it is thought to be due to mechanically enclosed air, or a slight swelling of the clay substance proper.

The quantity of water in a clay may be expressed in several ways:

1. Ratio of pore water to shrinkage water.
2. Per cent shrinkage water in terms of true clay volume.

This may be calculated by the formula: $$S = \frac{D\,(V_1 - V_2)\,100}{W}$$

S = Per cent shrinkage water in terms of true clay volume.
D—Sp. Gr. of powdered clay.
$V_1$—Vol. of clay briquet in wet state.
$V_2$—Vol. of clay briquet in dry state.
W—Weight of clay briquet in dry state.

3. Percentage of total water in terms of true clay volume, calculated from the formula: $$T = \frac{D\,(W_1 - W)\,100}{W}$$

T—Per cent total water in terms of true clay volume.
D—Sp. Gr. of powdered clay.
$W_1$—Weight of clay in wet state.
W—Weight of clay in dry state.
S—T—Volume of pore water, and

$\frac{S-T}{T}$ = Ratio pore to shrinkage water.

4. Percentage pore water in terms of true clay volume.
5. Percentage water in terms of dry clay weight.

### Chemically Combined Water

Chemically combined water, as its name indicates, is that which exists in the clay in chemical combination with other elements.

That which is combined in hydrous aluminum silicates passes off chiefly between 400 and 600 deg. C., muscovite loses its water between 500 and 700 deg. C., while hydrous iron oxides dehydrate between 150 and 350 deg. C.

Unless a clay contains considerable limonite or hydrous silica, the percentage of combined water is commonly about one-third the percentage of alumina found in clay. In pure or nearly pure kaolin there is nearly 14 per cent, and other clays contain varying amounts, ranging from this down to 3 or 4 per cent, the latter being the quantity found in some very sandy clays. The loss of its combined water is accompanied by a slight but variable shrinkage in the clay, which reaches its maximum some time after all the volatile matters have been driven off.

In many clay analyses the chemically combined water is determined as loss on ignition, which is incorrect if the clay contains carbon dioxide, sulphur trioxide, or organic matter, all of which are driven off, in part at least, at a dull red. A properly made chemical analysis should also differentiate between water driven off below 100 and above 100 deg. C.

### Slaking

When a lump of raw clay is immersed under water it falls to pieces or slakes, the process ceasing only when the clay has broken down to a fine powdery mass. The time required for this varies from a few minutes in the case of soft, porous clays, to several weeks for tough clays, and some may be incompletely disintegrated even after that. The slaking property is one of some practical importance, as easily slaking clays temper more readily, or if the material is to be washed or made into a slip, it disintegrates more rapidly in the process. It is also a rough test for distinguishing between clays of a high and low plastic strength.

The tentative method used is as follows: "The test-pieces are cubes made of a mixture of 50 per cent by weight, of ground flint, and 50 per cent of the clay to be tested, ground to pass a standard 28-mesh sieve (0.0232 inch hole, 0.0125 inch wire). The flint used is "potter's flint" (which can be secured from our Metuchen office) and shall all pass a standard 100-mesh sieve (0.0058 inch hole, 0.042 inch wire). Cubes of 1 inch size are to be cut from this mixture after it is worked to its best plastic consistency.

"These cubes are to be dried at room temperature until Air Dry, then a temperature between 65 and 75 deg. C. for at least 5 hours, and finally without cooling, at 100 deg. C. until approximately constant in weight.

"These cubes are placed on a screen having meshes of not less than two per inch, the wire to be not more than 1/16 inch diameter. The samples on screen should be carefully immersed in water, at 25 deg. C. (± 1 deg. C.), (77 deg. F. ± 2 deg. F.), with at least 1 inch water under the test piece, and not less than ½ inch nor more than 1 inch above it.

"The time required in minutes, for the whole test-piece to slake and to settle through the screen, is to be reported. The average of two determinations should be taken."

### Plasticity

Plasticity is probably by far the most important property of clay, lacking which it would be of comparatively little value for the manufacture of clay products, and for use as a loading agent in the making of paper.

A very broad conception, and quite satisfactory definition is that plasticity is the property which many bodies possess of changing form under pressure, without rupturing, which form they retain when the pressure ceases, it being understood that the amount of pressure required, and the degree of deformation possible, will vary with the material.

The sample of clay to be tested is mixed with water and kneaded until it becomes stiff enough to hold its shape in handling; made up into bars of 100 mm. in length and the cross section is one square inch—these bars are broken and figured in terms of modulus of rupture by the following formula:

$$\text{Modulus of rupture in pounds per square inch} = \frac{3W \times L}{2B \times D}$$

W — Breaking weight in pounds.
L — Distance between knife edge supports in inches.
B — Breadth of the bar in inches.
D — Depth of the bar in inches.

The bars are allowed to dry in the air for 10 hours and in a control dryer for 24 hours at 110 deg. C. While still warm, they are taken out and broken in a Riehle Breaking machine which gives the "W" of the formula. The modulus of rupture is figured by substituting "W" in the above formula.

### Texture

By the texture of a clay is meant its size of grain or fineness, and since this exerts an important influence on the physical properties, such as plasticity, shrinkage, porosity, fusibility, etc. it should receive considerable consideration. Many clays contain sand-grains of sufficient size to be visible to the naked eye, but the majority of the particles in clay are too small to be seen without the aid of a microscope, and are therefore so small that it becomes impossible to separate them with sieves.

Mechanical Analysis: In determining the texture of a clay, various methods of separation may be used, although it is perhaps of sufficient importance for practical purposes to determine the per cent of any sample that will pass through a sieve of 200 meshes to the inch. If it is desired to measure the size of all the grains found in the clay, some more delicate method of separation becomes necessary, and in order to do this it is essential that the mass of clay should first be thoroughly disintegrated.

This may be done by placing the clay in a stoppered bottle with water and a few drops of ammonium hydroxide, and putting it in a shaking machine. Here it is agitated until disintegration is complete.

Screen Analysis: If clays contain sizes of larger diameter than 0.066 mm. (0.0029 inch) these can be separated by screens, but water has to be used to wash the finer grains through the mesh. After the residues on the different sieves are dried, the material should be re-screened, as particles which may not pass a given mesh when wet, will do so when dry.

The purpose of a fineness test, according to the American Ceramic Society specifications, "is to so separate and classify the portion of a clay coarser than 0.0029 inch as to afford an index

of its sandiness and contamination with coarse impurities. It is of further service in making it easier to judge the character of the coarse material by the removal of the fines. The 0.0029 inch sieve is sufficiently fine to detect the sand in clays which are in the least "sandy" as the term is ordinarily used."

The sieves recommended are those which conform to what is known as the Rittinger scale based upon an opening of 0.0029 inch in the 200 mesh size, with a wire 0.0021 inch diameter the successive sieves having openings increasing in the ratio of the square root of 2 or 1.414. At least two sieves shall be used, and if only two, those of 0.0082 and 0.0029 inch openings. If more than two are used they shall include these. The clay is to be ground without crushing the sand particles. Three hundred grams are taken, dried at 110 deg. C. and slaked in enough water to make a slip. The sieves are dried, weighed, and the clay washed through them. After drying to constant weight, they are nexted with cover attached, and shaken for one minute. They are then weighed individually with the sandy residue in each.

Settling Method: A method known as the beaker settling method, and suggested by Whitney is simple, but somewhat inconvenient on account of the large amount of water required. Its operation is as follows:

The thoroughly disintegrated clay is transferred to a 3-inch beaker, which we may call (S). This is filled with water and thoroughly stirred. It is then allowed to settle until all solid particles larger than 0.05 mm. have subsided. This is determined by taking a sample of the turbid liquid from near the bottom of the beaker by means of a small tube, transferring a drop of it to a microscope slide, and measuring the size of the particles.

When the particles larger than 0.05 have subsided, the turbid liquid is carefully decanted into a larger beaker (M). This turbid liquid contains silt, fine silt, and clay, but no sand if the separation has been properly timed. The sediment in (S) consists of sand, containing still some silt, fine silt, and clay. This is stirred up with water and again allowed to settle until all the grains of sand have subsided, when the turbid liquid is again decanted into (M). This operation is continued until an examination of the sediment in (S) shows that all the particles smaller than 0.05 mm. have been removed. The contents of this beaker (S) are then weighed into a small porcelain dish and evaporated to dryness on the water-bath. When dry this sand and grit may be gently, ignited to burn off the organic matter, and when cool it is sifted through a series of sieves which will be described further on.

It is often convenient in separating the silt, fine silt, and clay from the sand to decant before the last portions of the sand have settled. This hastens the operation of separating the fine and coarse material, especially where there is a large mass of sand and but little fine material to be removed.

In this case the turbid liquid which is decanted is put into a separate beaker, and the sand which has been poured off is recovered by a further decantation, and when free from all fine material it is added to the sand in the porcelain dish while the latter is evaporating to dryness. The turbid liquid in the beaker (M) is thoroughly stirred and allowed to settle until a drop taken from near the bottom contains no particles larger than 0.01 mm. diameter. The liquid is then decanted into another beaker (P). The sediment remaining in (M) is again stirred, allowed to settle and decanted as before, continuing the operation until all particles smaller than 0.01 mm. have been removed. Wash the sediment from (M) into a dish, evaporate, ignite and weigh.

Stir up sediment in beaker (P), then allow to settle until all particles larger than 0.005 mm. have subsided and decant turbid liquid into beaker (C). Keep repeating until all particles smaller than 0.005 have settled and weigh the sediment in (C) after drying. The final suspension represents clay.

The sand separated in the beginning of the operation and dried and ignited in the porcelain dish is sifted through a series of sieves having openings of 2 mm., 1 mm., and .05 mm., dia., respectively.

The product passing through the lower sieve is then sifted through two grades of bolting-cloth Nos. 5 and 13, having holes which are square, approximately 0.25 and 0.1 mm. in linear dimensions.

Each of these grades of sand is weighed without previous drying as the amount of hygroscopic moisture is usually inappreciable.

The water used in the mechanical analysis should be distilled, if possible, but clear river, well or hydrant water may be used. In case distilled water is not available, the solid matter in suspension or in solution in the water used should be determined by evaporating 500 cc of the water to dryness, and igniting and weighing the residue. Allowance should then be made for this residue in the clay determinations.

Microscopic Method: A good method for determining the texture of clay by microscopic examination is as follows: "A sample is mounted in Canada balsam, diluted with about 20 per cent Xylol. A few drops of this mixture are placed on a piece of window glass and a small amount of pulverized clay sample mixed with it until the particles are evenly disseminated in the balsam. Two slides 50 x 75 mm. are used for mounting the samples. A drop of the mixture of Canada balsam and clay is placed on the clean slide. The clay in this mixture should weigh about 0.002 grams. A second thin slide is placed on top of the drop and the slides gently pressed together and slid back and forth until there is an even distribution of clay and balsam. The mixture should cover a circular space of two inches in diameter.

"The microscope is provided with a micrometer eyepiece, the smallest divisions of which are 10 microns at a magnification of 200 diameters, and 4½ microns at a magnification of 500 diameters. A magnification of 200 diameters is usually employed.

"In making the determination, the microscope is first focused on an area at one corner of the slide and the total number of particles in a quarter field counted, making note of the size of each particle. In our work the "size" or "diameter" of the particle has been taken as the side of a square having similar area.

"This 'squaring' of the particle is carried out visually with the aid of the squared ruling of the eyepiece. Such procedure is approximate but probably gives values as nearly correct as any method can give on the irregularly shaped particles.

"In making this count particles are grouped as being 1, 2, 5, 10, 15, 20, 30, 40, etc. microns in diameter. Our practice has been to count the number of largest particles first.

"Sufficient areas are examined so that a fair average of the number of particles of each size in a quarter field is obtained. For a sample of clay which has passed through a 200-mesh screen, this will entail estimation of the number of particles 2 and 5 microns in diameter in about 10 areas, 10 and 15 microns in diameter in some 40 areas, 20 and 30 microns in diameter in some 100 areas, while as many as 300 separate areas may have to be examined for a correct estimation of the average number of particles 40 microns or over.

CALCULATION—An example of the method of calculation is given below:

| Diameter in microns | Average number of particles in a quarter field | | Relative weight | Per cent by weight | | Microns |
|---|---|---|---|---|---|---|
| 20 | 1 | $1x20^3$ | 8,000 | 11.1 | 0.111x20 | 2.2 |
| 15 | 3 | $3x15^3$ | 10,125 | 14.1 | 0.141x15 | 2.1 |
| 10 | 40 | $40x10^3$ | 40,000 | 55.6 | 0.556x10 | 5.6 |
| 5 | 110 | $110x\ 5^3$ | 13,750 | 19.2 | 0.192x 5 | 1.0 |
| Total relative weight..... | | | 71,875 | 100.0 | Aver. size | 10.9 |

The above figures are imaginary and for example only. They are not representative of any one clay.

## Coating Clays

It was with the development of the "H. T." process that domestic clay came into prominence, as a material for surface coating paper.

The older men in the industry can well remember the numerous times they have attempted to adopt domestic clay to their coat-

ing processes, only to throw up their hands, and go back to imported clays. This, of course, was before any processing of clay had been tried on a commercial basis.

It is now a different story and the growth in the use of American Coating Clay is shown by years as follows:

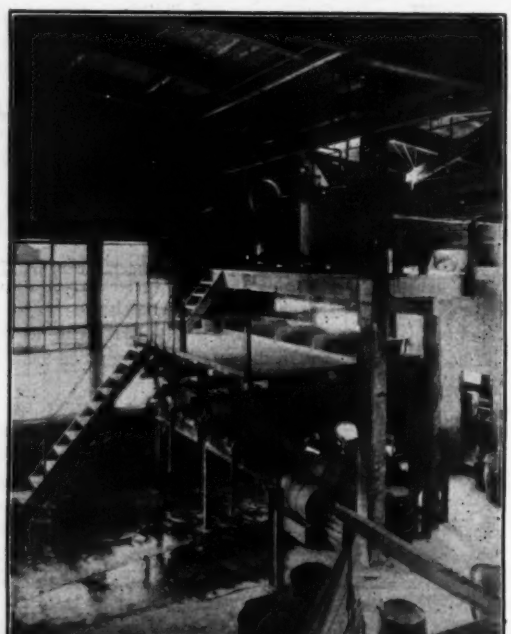
1925 .....Started production
1926 ..... 700 per cent increase over 1925
1927 .....2000 per cent increase over 1925
1928 .....2650 per cent increase over 1925

Approximately one-half of the clay used by the paper coating industry this year will be American clays. These figures do not take into consideration the tonnage of this clay that is used by mills for highest grade filler work, or that used by the window shade, and wall paper coaters.

From the analysis of the above, it is obvious that tremendous strides have been made, when over one-half of the English Clay imported for coating purposes has been displaced in the short space of four years, especially when it required so much educational work and intensive demonstration to break down the prejudice in favor of the English clay, which had been in use since the first paper was coated with material.

In order to coat paper with this domestic clay, a few basic precautions should be taken into consideration—

(1) This Clay contains approximately 3 per cent moisture, while most imported clays contain up to 15 per cent. With this difference, enough water must be added to the mix to take care of the 10 to 12 per cent additional solids, or more



Coating Clay Mixer, Front View

casein must be used to get equal adhesiveness. This does not mean that more casein must be used per hundred pounds of domestic clay, as it has been proven that it requires less, but the difference in solids must be corrected when adjusting this with water. A convenient mixture has been found to be 45 per cent (97 per cent Dry) clay and 55 per cent water.

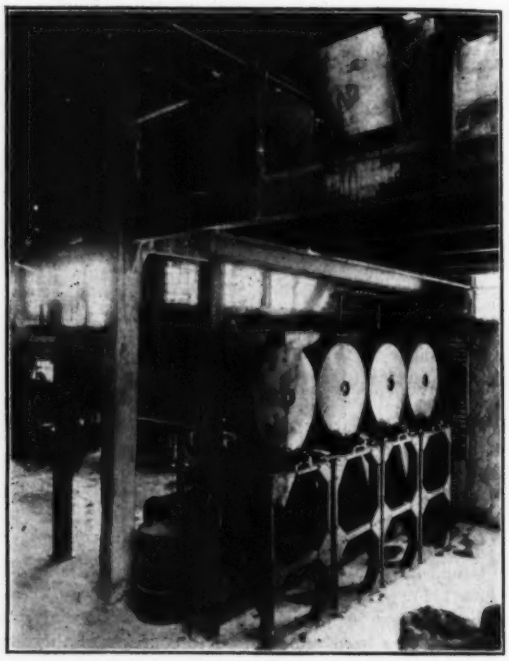
With the greater fineness of individual particles, naturally, this clay is going to be very plastic. This condition must be overcome before it will spread and brush well on the paper. By allowing a little longer agitation with your present equipment, or by installing a system such as is illustrated, a mix of greater "free-flowing" ability and greater coating efficiency may be obtained.

To further aid the agitation in dispersing the clay, one-half of one per cent of sodium silicate should be added, either at the time of adding the water, or, well toward the completion of the mixing.

It is readily noticeable, what an important part electrolytes play in helping to break down the plasticity of the clay, and in order to prepare a coating mix of the correct body without the use of too much water, their use is recommended.

**Procedure for Using American Coating Clays**

As a guide to the use and adoption of American clay to paper



Coating Clay Mixer, Side View

coating processes, we offer the following procedure and formulas for general use:

Proceed by making a regular clay coating (litho. coat) with 2000 pounds of clay, 2500 pounds water and 10 pounds of sodium silicate. After this mixture is allowed to agitate for from ¾ to 3 hours (the longer the better) add 15 per cent of casein, which has been properly cut with the necessary alkalies. Allow this mixture to continue agitating until it must be drawn for the machines.

It might be well at this time to discuss the alkali or alkalies that we have found produce the best results with domestic coating clay. Sodium carbonate, borax, ammonia, tri-sodium phosphate and others have been used alone, and in combination. A mixture of 8 per cent to 10 per cent of sodium carbonate and 2 to 4 per cent ammonia (26 per cent by weight) gives the best results under average conditions. When using American clay and satin white, borax as a casein solvent should never be used, although it acts as a great sweetening and preserving agent for coating solutions that stand for considerable time before using. When borax is used alone it thickens the mix.

We like a combination of soda ash and ammonia because it gives the necessary alkali in terms of $Na_2O$ that is required to correct a lower pH. customary in domestic coating clay. Another desirable feature is that whatever ammonia is added, will go off as a gas during the drying process, leaving only traces of its alkali, which should render the sheet more waterproof, and smoothen the "feel."

Where considerable satin white is used, a combination of soda ash and tri-sodium phosphate gives a very free-flowing solution that spreads and brushes well. It is noticeable when casein, cut with the above alkalies, is used with domestic clay and satin white, that less anti-froth oil has to be used to eliminate the few pin-holes that appear.

The percentage of alkalies to be used in cutting the casein, due to its variation, requires considerable study, but it has been the writer's experience, that casein, cut with a small amount of alkali as possible, gives the best adhesive strength. Casein can be cut cold with approximately five per cent soda ash and with a less amount of caustic soda under carefully controlled conditions, but they also offer disadvantages, especially when using domestic clay. Where casein is prepared by agitating at a temperature of 130 to 140 deg. F., for approximately one hour, 10 to 12 per cent soda ash cuts it very nicely and also gives a casein that mixes well with the clay. The other alkalies used as casein solvents should be based on the above percentage according to their chemical equivalents.

No increased amount of casein solvent is necessary when using domestic clay alone or with satin white, nor does an excess amount of either of the alkalies tend to thicken the coating mix; they aid in thinning and freeing the color, if anything.

Never add the casein hot to the above formula; always allow it to cool down to around 70 to 90 deg. F. Hot casein, especially when a combination of domestic clay and satin white is used, makes the solution so thick, it is impossible to apply it to the paper.

After this regular clay coat has agitated as long as possible, and the casein added according to the above method, it is ready to be screened, and drawn off as needed for the coating machines. If the above recommendations have been carried out, no difficulty should be encountered in screening the mix. All types, from crude hand pounded, to the new electric vibrator screens, have been used with about the same efficiency.

### Clay Mixtures

As the color is drawn from the mixer to the tubs, for convenience in conveying to the coaters, the necessary water, to give the proper viscosity, is added. Often this is not required, but certain type agitators and coating machines require it. The amount of water to be added varies from one gallon to two or three pails. Each local mill condition must be studied to insure uniform control. In the case where double coaters are used, you cannot add as much water as you can for single coating machines, as difficulties result in drying the paper fast enough to avoid sticking and picking on the suction apron used to convey the paper over the drier.

Tinting procedures are generally carried out in the tubs, and it has been our experience that very little trouble results with any of the dyestuff, chrome colors, lakes, etc. when using domestic clay. Being a natural shade clay, it is very susceptible to tinting. It gives a base that the already tinted, imported clays lack, resulting in greater dyestuff efficiency.

Satin white or other materials used for special requirements can be mixed with water in separate agitators to secure the desired consistency for addition to the clay, or, they can be added in purchase form. Precautions should always be taken to see that proper agitating and mixing time is allowed so that the whole mass will become thoroughly mixed, and carefully screened. This will insure against any un-dissolved or coarse particles finding their way into the color.

The results from using domestic clay with satin white, or with blanc fixe, raffold, calcium carbonate, and other materials have been gratifying, and indeed offer no more difficulties than those encountered when imported clays are used.

If proper agitation is given the clay, correct alkalies used to cut the casein, dyestuffs of the paper nature and the other methods outlined above are followed, surprising results should be obtained, and a paper of many superior qualities should be produced.

This clay works very well with starch, glue, gum and other substitute adhesives. Recent reports from mills using the above materials show reductions in amounts used, and yet securing the same effects, over other coating clays.

Other formulas for coating different grades of paper and board with domestic clay range from 25 to 100 per cent "H. T." domestic clay. The amounts of casein required vary from as low as 12 to 20 per cent depending upon the grade of paper made and its intended use.

Some authorities claim that considerably less casein is required to secure correct adhesiveness when using domestic clay for coating. In a few instances this has been proven correct, but we can say, however, that no more casein is necessary and that continual use of this clay should show economy in this direction.

### Domestic Clay Advantages

A few of the advantages offered to the paper coater using domestic clay, are: (1) Greater covering power, resulting in greater color efficiency. It also makes it easy to secure the desired weight of color on the sheet.

(2) With the finest and most uniform individual particle this clay finishes much higher than any other clay, which should effect considerable saving in calendering costs, and reduce the "seconds" due to blackening of the paper on calendering. Higher finish coated papers are in demand today.

(3) We have showed where this clay greatly increases the opacity of paper. This is desirable and necessary when using a transparent raw stock, and when the paper is to be used for printing with multiple colors, and fine screen work.

(4) Being treated by a mechanical and chemical process, greater purity and uniformity of texture and color can be assured, which should materially reduce "seconds" and waste.

(5) The printability of paper coated with domestic clay is indeed pleasing. We have heard of very few complaints directed to it. Of course, so many other factors enter into a subject like this that the space here does not allow its discussion.

Other advantages such as reduced inventories, low moisture content and adequate supply for a century, besides lower costs of coating per ton of paper, surely makes its consideration and ultimate adoption by those of you who have not done so, desirable.

In conclusion, we add that it is appreciated that there are a few of the imported clays we cannot meet in color, as yet, but it is our promise to the paper manufacturers, and coaters, that with their continued support, we hope soon to have a processed clay that will beat any clay in the world as to color and proper qualities for use in the paper industry.

The best way to measure this feature is to take a pint measure made of non-corrosive material, equip with a one-quarter inch brass pipe outlet in the bottom; also solder some kind of a handle to this measure.

The test is to insert this measure into the color tub (color which is just ready for addition to the machine color pans) fill to top with this color and record the time it takes for the color to run back into the tub.

Color works very well on the majority of machines that takes from 20 to 25 seconds for one pint of color to run through this outfit.

### Best Simple Settling Test for Coating Clays

100 c.c. of water is placed in a graduated cylinder, to which we add 5 grams of the clay to be tested, sample or samples are shaken well, and the same number of times. The number of c.c. settled in 30 and 60 minute periods are carefully recorded.

By this comparison a fairly accurate knowledge of the fineness of grain can be secured.

Under average conditions 40 to 42 cc. for 30 minutes and 42 to 44 cc. for 60 minutes give a clay that is free-flowing and spreads well on the paper if the proper mix with casein is made.

# Roll Winder Development*

By James A. Cameron[1]

With the modern high speed presses the limit of production is not altogether in proportion to the potential speed of the presses. There are limits to which this speed can be utilized, owing largely to the fact that rolls of newsprint or book paper which will unwind smoothly and dependably without breaks at the top possible speed of the presses are not obtainable from mills except those which have equipped with modern types of roll winders, and as yet they are all too few in number. The head of the mechanical department of one of the great New York dailies was asked what he could do toward jumping up the net output of his pressroom per hour if he had perfect rolls of newsprint to deal with. "As to paper quality we have no serious complaint in the usual run. Newsprint paper is practically standardized, but you said rolls of paper, meaning rolls. That's a different matter. It is in the roll where the catch lies, the physical condition of the roll. It is one of the least pleasing topics we can talk about, as the lack of kick proof rolls is the greatest single cause of grief and delay in the pressroom."

The above is the gist but not the exact words of the conversation. He continued "If by a perfect roll you mean one that arrives in the pressroom after undergoing the punishment of shipment by steamer, rail and truck so that it is still perfectly round, straight and even on the ends with firmly set cores and is equally firm and hard all the way through the roll, then we have a roll that will unwind at top speed from the outside of the roll clear down to the core without jump or vibration or web break."

In addition to the points outlined by the party quoted in previous paragraphs as to what is expected of a really good roll, it may be said that a roll which is firmly and compactly wound

TWO DRUM "SURFACE WIND" SYSTEM

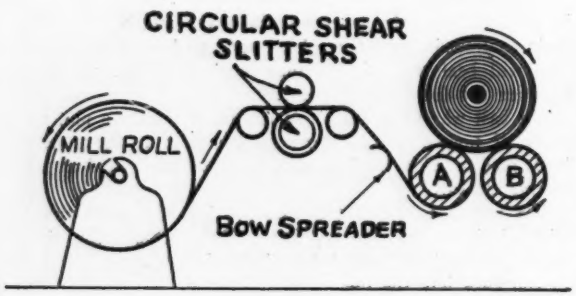



FIG. 1.

from the core to the outside actually contains more paper both as to weight and as to the linear length of the paper in the roll, in some cases approximately 12 per cent to 15 per cent more. This makes possible an economy in the handling of the rolls in the mill, in shipment, in the pressroom or in storage. So much for the desirability and the practical reasons for the modern demand for good rolls.

The same statements applying to newsprint pressrooms also apply to magazine, catalog and book printing and in like manner to many other users of roll paper such as manufacturers of bags, envelopes, cartons and a host of products made of paper using high speed web fed machines.

A poor roll often makes quite as much or more trouble than poor paper and in the average case the user of the paper would

FOUR DRUM-MULTIPLE SHAFT "SURFACE WIND" SYSTEM SEPARATE SHAFT FOR EACH ROLL

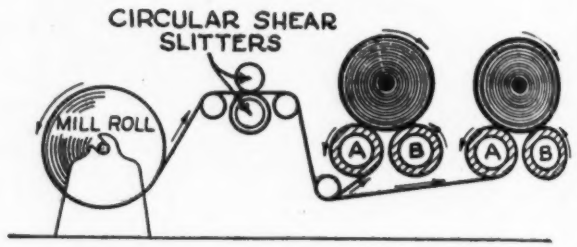



FIG. 2.

be better served by good rolls of reasonably good paper than by poor rolls of really good paper.

### Test Results

So much for the user of the roll. Now a word or two for the producer of the roll. Until quite recently there has been little active and critical interest given to roll winders by the average maker of them or user of them. But high speed production of paper and an increasing high standard of quality insisted on by the customer, quality both in the paper and in the roll, has focused the attention of many minds on the problem of developing and introducing more efficient roll winding methods coupled of course with improved methods of slitting. All the builders of winders with no exception save one, have proceeded on the assumption that the circular shears, that is to say two overlapping circular blades, were the proper means for slitting the sheet, and in nearly every case the assumption was that the proper way of winding the sheet was to pass it up between two drums, one of which revolved at a higher speed than the other, with the roll of paper winding up on a spindle or wind shaft resting in the valley between these two drums. (Fig. 1.) In one instance a winder builder combined two of these two drum winders into one machine, making a four drum winder. With this four drum combination, the ever present problem of separating the rolls as they are wound side by side on a single pair of drums was obviated, as the rolls were wound separately or alternating from one pair of drums to the other. (Fig. 2.)

With the old two drum method, a bow spreader is necessary to separate the several sections of the web before they reach the drums so that the rolls will not interweave. This is a difficult job, not always dependable and at best it requires constant attention. The sheet is somewhat stretched by this spreading process. As to the roll of paper itself, it is permitted to form around the core, hit or miss as to the density of the roll, and even by the skill and constant manoeuvering of the operator the central portions of the roll are less dense than the outside portions. This is a result too familiar with all practical men to require any further comment.

* Presented at fall meeting of TAPPI, Richmond, Va., Sept. 25, 1929.

[1] Member TAPPI, president Cameron Machine Co., 61 Poplar St., Brooklyn, N. Y.

### Score Cut Slitting

The product of one machine builder consists of a slitting method known as the score cut, in which slitters are applied either directly to the under surface of one of the two drums of the machine, (Fig. 3), or to a special drum just below the front drum. Instead of the paper passing up between the two drums, it

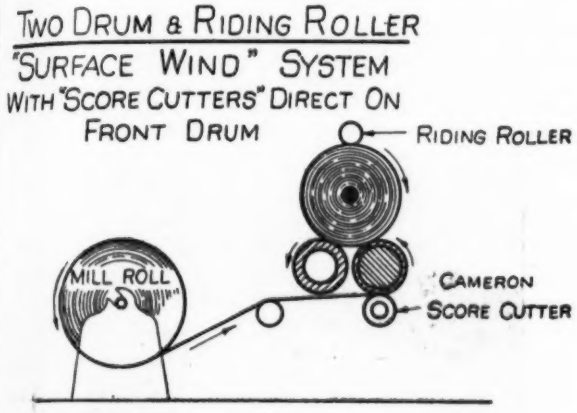



FIG. 3.

passes over the surface of the front drum and both of the drums are maintained at a fixed constant surface speed with respect to each other, obviating the necessity of any manual or automatic means for varying the speed between the two drums, as variation is not required. (Fig. 4.) The density of the roll of paper is controlled by the pressure of the riding roll which is driven in time with the surface speed of the drums so that the sheet is made compact by pressure rather than by pull on the web which is sometimes excessive in the old style two drum winders. With an automatic system of weighting the riding roll a heavy pressure is applied at the start of the winding when the roll of paper is light, thereby causing the central portions of the roll to be absolutely dense and firm and of any degree of hardness required. (Fig. 5.) This same degree of hardness is maintained

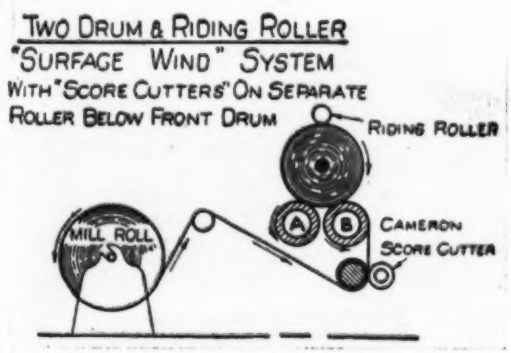



FIG. 4.

throughout the roll through the fact that the pressure of the riding roll, automatically decreases as the diameter of the roll of paper builds up.

The bow spreader is eliminated in this type of machine on account of the use on the front drum of a system of grooving which supplies a dependable method of automatically separating the sheets as to their edges before they are wound up. In this type of machine it is important to note that the full strength of the unsevered web is maintained clear up to the point where the sheet is going to be wound before the slitting is done, thus obviating many a break that otherwise would occur. This position of slitting is made possible only by the use of the score cut method.

The bow spreader is eliminated as the drum grooves are more dependable and do their work in a preferable way. (Fig. 6.) They are absolutely automatic and furthermore the sheet is not

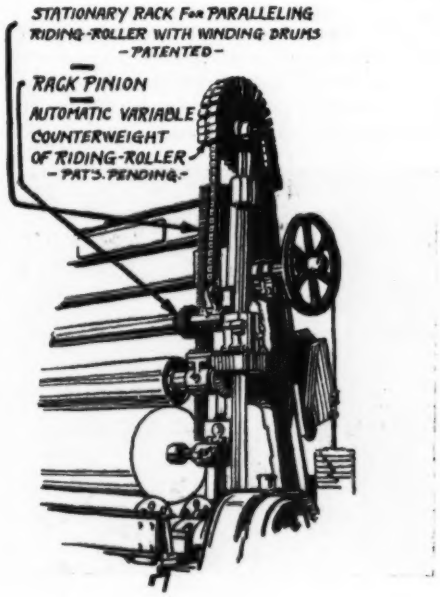



FIG. 5.

stretched as to any portion of the surface, but lies smooth and flat and free of wrinkles as it proceeds to the winding. The heavy pressure of the riding roll at the start and the automatic reduction of this pressure as the roll builds up in diameter not only gives firmly wound rolls of even density from the core out, but it also compacts more weight of paper and more linear length of paper in a given diameter of roll.

FIG. 6.

**Diagram showing the action and effect of the patented system of drum surface grooving used on Camachine Mill Type Roll-Winders.**

The above is a brief outline of the progress of winder development to date. Considerable could be written to clarify anyone of the points brought up, and questions are invited from any one interested in any of the points sketchily outlined above.

# Modern Recovery In Sulphate And Soda Mills*

## A Resume on Previous Papers and Progress Report

By C. L. Wagner[1]

Among the outstanding pulp mill developments made in the last decade, the Wagner recovery furnace occupies a very prominent place. It has now been commercially perfected after six years of work and made available to all, rather than to one group.

The development, which was mainly carried out on commercial scale, was necessarily slow and expensive and required a considerable faith and willingness to spend money for reseaerch and development. With the cooperation and backing of the J. O. Ross Engineering Corporation, sole licensees, we are at last at the point where results can be accurately predicted.

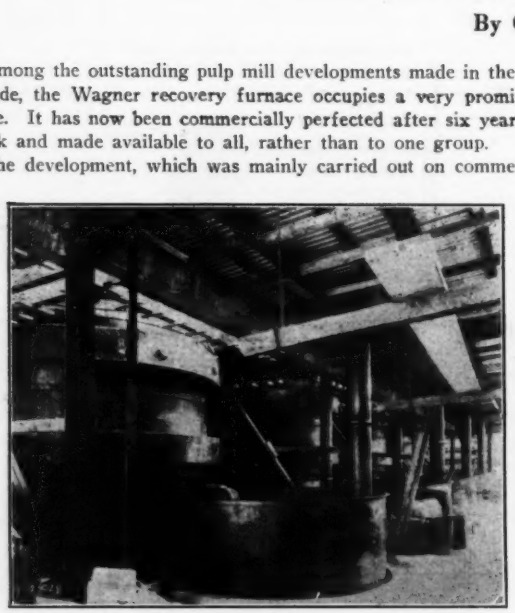


FIG. 1.

**Wagner Furnace Shells during construction, showing Shells, Shields around solution tanks and vents.**

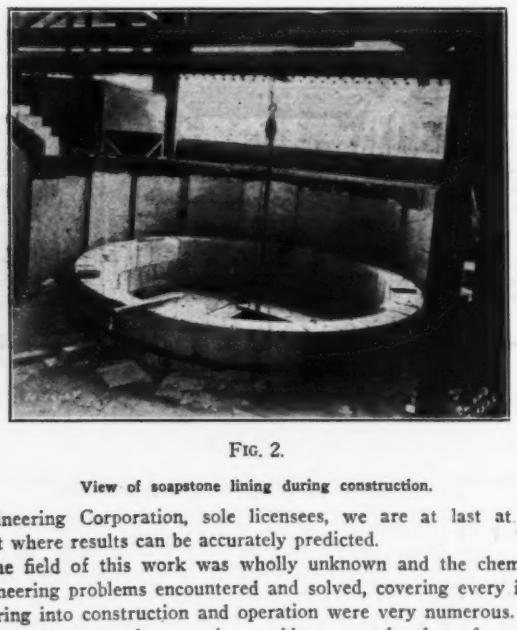


FIG. 2.

**View of soapstone lining during construction.**

The field of this work was wholly unknown and the chemical engineering problems encountered and solved, covering every item entering into construction and operation were very numerous.

As an instance of a complex problem, we take that of removing the chemical carried out during combustion. While under proper operation, this is a very small percentage of the total, under improper conditions, it might be so serious as to make the process uneconomical. The gases leave the furnace at from 1900 to 2300 deg. F., carrying with them a certain amount of chemical as smoke, that is, the particles of chemical have colloidal dimensions. In order to collect these suspended solids the gases must be cooled thereby requiring a boiler of special design, the primary function of the boiler being to cool the gases and collect such chemicals as are present. Steam in every case must be a secondary consideration to chemical functions and still the utmost amount of it must be secured from the boiler to assure the economy of the recovery.

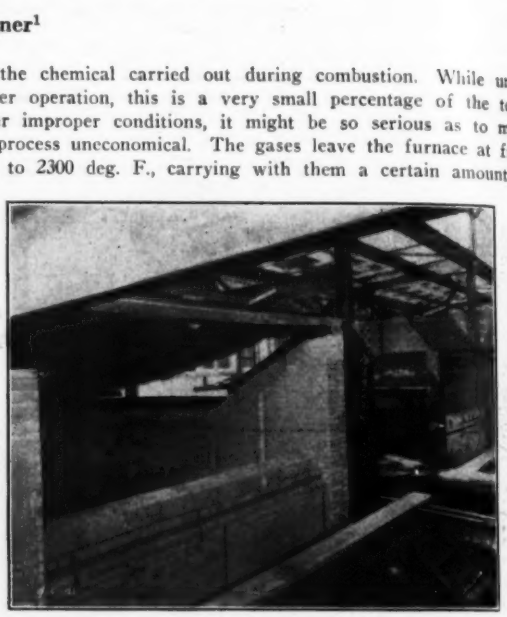


FIG. 3.

**Complete lining of Wagner furnace, showing bridge wall and throat.**

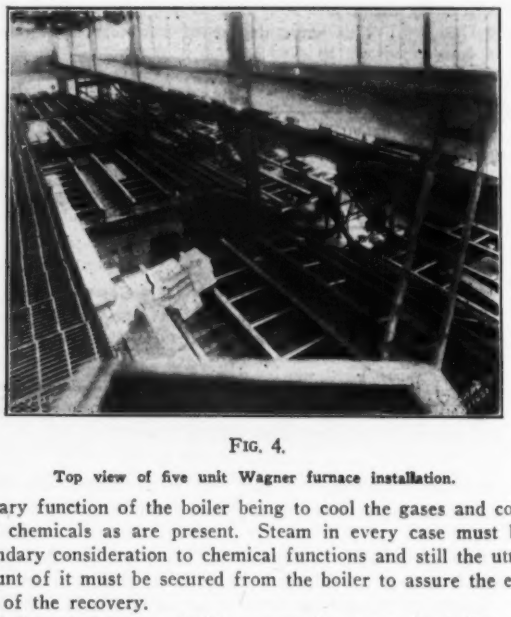


FIG. 4.

**Top view of five unit Wagner furnace installation.**

We have had very valuable cooperation from the boiler companies and now have extended a water wall roof to cover the furnace, this being an integral part of both boiler and furnace. When the gases leave the boiler at 450-500 deg. F. the heavier

* Presented at fall meeting of TAPPI, Richmond, Va., September 25, 1929.
[1] Member TAPPI, Engineer J. O. Ross Engineering Corp., New York, N. Y.

particles have already been deposited, and centrifugal force as utilized in the cyclone device, will no longer operate within the limits of a practical apparatus.

It has also been apparent that the dust cloud possessed an electric charge, fortunately, a negative one, so that the charge must be neutralized before the particles can even be wetted.

### Principles Involved

Our solution of the problem involves a combination of several factors, namely, centrifugal force countercurrent sprays having a positive electric charge, and wet contact surface for the *gas-water suspension* removal of chemical already in solution. That this is effective has been proven beyond any doubt and total furnace recoveries of 97-98 per cent are obtained, part of the loss being undetermined.

We have a further development, where perfectly clear gases can be liberated, this being to cool the gases to 180 to 220 deg. F. by means of a specially designed water heating economizer and then passing them through a mechanically operated bag filter, whereby no visible chemicals leave the stack. If the water at 160 deg. F. can be used, the thermal efficiency of the unit is up to or higher than that of modern boiler units.

### Corrosion Eliminated

Corrosion has been eliminated as a vital factor in sulphate, as

FIG. 5.

View of Wagner furnace installation of five units—Note duct for non-condensible gases to furnaces for the elimination of odors.

with our system, sulphur dioxide liberation is so small as to be negligible. In the scrubber, very weak green or white liquor can be used to overcome acidity, but our principal sulphur loss is as carbon oxysulphide. Erosion of linings and boiler walls is no longer serious. Temperatures and gas velocities are so regulated by the arrangement, that no localizing action can take place.

Equipment is practically standardized and while location and setting may vary considerably, with proper density of liquors, kinds of woods or raw materials make very little difference in operation. The only difference between the soda and sulphate furnace is the arrangement of the bottom or hearth and introduction of primary air nozzles. Secondary air supply in both cases is similar.

### Odorless Kraft Process

One of the benefits to the sulphate pulp industry, which cannot be measured by its money value, is the elimination of odors, notably mercaptans and sulphide gases. These ordors, which are offensive at long distances originate in digesters, evaporators, smelter rotaries and disc evaporators and in minor amounts from liquor storage tanks.

All of these gases, practically non-condensible, are collected and introduced to the secondary combustion zone of the Wagner furnace and easily destroyed. The collection of gases is not difficult or expensive and makes it possible to have a sulphate mill without offensive odors, which eliminates the probability of lawsuits and complaints.

What the actual money benefits and the improvement in working conditions are, can be easily ascertained. Under average mill conditions with the old recovery systems and the new, the results can be represented by lines, as follows:

STEAM PRODUCTION

Wagner Furnace....
Sulphate Smelter..
Soda Rotary and...
Leechers.....

LABOR REQUIRED

Wagner Furnace....
Sulphate Smelter..
Soda Rotary and...
Leechers.....

FUEL REQUIRED

Wagner Furnace....
Sulphate Smelter..
Soda Rotary and...
Leechers.....

CHEMICAL LOSSES

Wagner Furnace....
Sulphate Smelter..
Soda Rotary and...
Leechers.....

MAINTENANCE COST PER TON

Wagner Furnace....
Sulphate Smelter..
Soda Rotary and...
Leechers.....

DIRT, SMOKE AND ODOR

Wagner Furnace....
Sulphate Smelter..
Soda Rotary and...
Leechers.....

Our confidence in this development is considerably strengthened by a repeat order of large dimensions, where our furnaces have been in use long enough so that actual figures are available on all phases.

As a general rule, the actual savings over the old systems, will wipe out the total initial investment within two years. This includes boiler cost, which is really chargeable to power account.

In other words, a constant source of expense in recovering chemical, has been converted to a profit paying operation.

## U. S. Rubber Co. Takes Over Paper Mill

[FROM OUR REGULAR CORRESPONDENT]

BALLSTON SPA, N. Y., September 30, 1929.—The Empire Mill of the Kaydeross Paper Company, at Rock City Falls, has been taken over by the United States Rubber Company under a long term lease. It is said that a product described as a combination of paper and rubber will be manufactured at the plant which has been closed since early summer when the Kaydeross Railway Company, operating the only transportation system serving the village, suspended operations. At that time the railway company was ordered by the state to make certain repairs or discontinue its cars. The company chose the latter course claiming that its resources would not permit improvements.

# Shrinkage*

By Aubrey T. Taylor[1]

Despite the enormous strides made in the reduction of waste, we are neverthless confronted with a $6,000,000 fiber loss in our industry. This $6,000,000 loss forms a portion of what we commonly designate shrinkage. The total raw materials furnished (including size, alum and clay) less the paper produced equals the shrinkage for any given period or shall we say, the difference between the fiber furnished and the paper made constitutes shrinkage. Then too we might make an allowance for the loss in moisture on conversion from pulp to paper. It is very confusing to learn that a certain mill is running a paper with about 2 per cent shrinkage when you consider 4 per cent good for the same grade. Your figures of 4 per cent may represent the same actual loss as the other mill and the difference can, in many cases, be accounted for by the different methods in calculating shrinkage. It would seem that a uniform method in computing the amount of shrinkage would be very desirable as it would enable mills to compare experiences, without the suspicion that possibly the other fellow used a different method to arrive at his results. In the writer's opinion, the shrinkage represents the difference between the amount of raw material furnished (including size, alum and clay) and the amount of paper produced (less cores and plugs etc.) This total could be then subdivided into (a) Recoverable losses such as, fiber loss to sewer and (b) Irrecoverable losses, such as, loss of moisture from pulp to paper.

### Mill Survey

In order to obtain a close check on whitewater losses and to locate the leaks, we conducted a thorough survey of our mill. At this time all the whitewater with the exception of a portion of the tray water pumped to the machine mixing box, was returned to a whitewater tank in the basement and used only to furnish the beaters. Any excess, in the tank overflowed to the sewer and this tank was overflowing almost continuously. The survey pointed to the following factors as responsible for the major part of our losses:

1. Large amount of whitewater to sewer.
2. Excess fresh water used on machines.
3. Inaccurate measuring of raw materials.
4. Moisture loss in conversion from pulp to paper.

The groundwood received from our Colemans Falls plant was charged to us at 31 per cent air dry and moisture tests revealed that this pulp averaged 30 per cent air dry. This pulp was furnished to the beaters on the basis of 10 pounds air dry pulp per lap. Actual tests showed that the laps varied from 9 to 11 pounds with an average of about 10¼ pounds per lap.

By correcting the amount of groundwood charged to the mill and weighing the pulp into the beaters we reduced our shrinkage figure nearly 25 tons a month.

### Reducing Amount of Water Used

Five fresh water showers were used on each machine. The amount of fresh water used was reduced by cutting out four of the five showers on each machine. The whitewater overflow was measured and sampled both before and after reducing the amount of water. Table I shows the results obtained by reducing the amount of fresh water consumed:

TABLE 1

| Machine | Fiber loss 5 showers Pounds per day | Fiber loss 1 shower Pounds per day | Saving |
|---|---|---|---|
| No. 1 | 3,746 pounds | 2,274 pounds | 1,472 pounds |
| No. 2 | 4,419 " | 3,787 " | 628 " |
| Totals | 8,165 " | 6,061 " | 2,100 " |

No trouble was experienced on the paper machines after the number of showers were cut down. In fact in our case the wire life was increased about 25 per cent due to the deleterious character of the river water used. Since then we have changed our source of water supply to a creek which supplies the mill from a reservoir. This change resulted in a further lengthening of wire life.

### Fiber Recovered by Savealls

Two Improved Paper Machinery Company savealls were installed, one for each machine, and connected directly to the whitewater tank. The savealls eliminated the overflow from the tank on the majority of our papers and decreased the shrinkage from all sources by approximately one third.

For the year 1927 our books show a loss of 1,470 tons or about 9¼ per cent shrinkage. The following year after the savealls had been installed our loss was reduced to 1,004 tons or a shrinkage of 5.9 per cent showing a saving of 466 tons of pulp for the year 1928 with a 6 per cent higher production. Figuring the stock recovered at $50.00 a ton, which would be a minimum figure, the equipment shows a return for $23,300. on an investment of approximately $6,000.

In our mill we make several different grades, using different classes of stock, such as sulphite, sulphate, groundwood and old papers. The saveall operates more efficiently on long fibered stock such as sulphite and sulphate papers. Shorter fibers as groundwood and old papers, fill up the wire of the saveall reducing the efficiency of the equipment and of course increasing the amount of fiber lost. In Table 2 actual shrinkage figures are given covering a year's production on various grades:

TABLE 2

| Grade | Furnish | Shrinkage |
|---|---|---|
| A | 50% Sulphite<br>40% Groundwood<br>10% Overissues | 5.1 per cent |
| B | 100% Sulphate | 1.9 per cent |
| C | 75% Sulphite<br>25% Groundwood | 4.6 per cent |
| D | 75% Sulphite<br>25% Groundwood | .8 per cent |
| E | 30% Sulphite<br>70% Groundwood | 3.9 per cent |
| F | 20% Sulphite<br>20% Overissues<br>60% Groundwood | 12.2 per cent |

The shrinkage loss is given as a percentage on the stock furnished and includes allowance for loss of moisture from pulp to paper. The greatest loss is found on paper made with spruce groundwood and old papers, decreasing to a minimum in case of long fibered stock as Grade B.

The fiber lost in the effluent passing to the sewer should account for the difference between paper made and stock furnished after making allowance for loss in moisture, alum, size, plugs and cores. Several test runs were made on our No. 1 machine to check our actual loss to the sewer against the amount shown on our books. Weirs were placed in the sewer lines and readings of the flow were taken every fifteen minutes together with samples of the effluent. The data given in Table 3 represents a fifty ton run on each grade:

TABLE 3

| Grade | Furnished Pounds | Paper Made Pounds | Loss Pounds | Gal. Effluent to sewer | Air Dry Pounds per 1,000 gal. | Total Fiber Pounds |
|---|---|---|---|---|---|---|
| B | 98,750 | 95,015 | 3,735 | 1,261,157 | 2.85 | 3,596 |
| D | 103,000 | 99,360 | 3,640 | 961,668 | 3.63 | 3,492 |
| | Fiber unaccounted for Pounds | | | Per cent total shrinkage unaccounted for | | |
| | 139 | | | 3.83 | | |
| | 148 | | | 4.00 | | |

Inasmuch as practically all of our raw material is weighed into

* Presented at fall meeting of TAPPI, Richmond, Va., Sept. 26, 1929.

[1] Assoc. Member TAPPI, Chief Chemist, Bedford Pulp and Paper Co., Big Island, Va.

the beater, accurate figures on the amount furnished were easily obtained. The paper made is figured on an air dry basis and the weight of plugs and cores allowed for. The shrinkage of the recoverable loss can be satisfactorily accounted for to within about 3½ per cent of the total loss.

In mills where the stock is furnished to the beaters in slush form, it is very difficult to check up on the shrinkage as the amount of pulp furnished is in most cases estimated. The pulp mill is arbitrarily credited with a certain yield per cord and the paper mill has to make up the difference, either plus or minus. Now if we can account for all of our recoverable losses and add to this correction for moisture, sizing materials and clay, this total would give the shrinkage and in our case we believe more accurately than by establishing a fixed yield for our pulp mill.

Accurate cost figures are essential in any program of waste reduction, and this means reliable shrinkage figures. It has been repeatedly demonstrated that the installation of saveall equipment and reuse of whitewater will reduce the recoverable shrinkage close to the vanishing point. Mill conditions vary and methods that produce excellent results in one mill often fail to give satisfaction when applied to another plant. A careful survey of your mill will aid materially in selecting the equipment best suited for your particular requirements.

Keen competition coupled with the desire of many of our states to reduce stream pollution indicates the necessity of cutting our fiber loss to a minimum. Today waste is not tolerated, raw materials must be conserved. The amount of fiber run into the river yesterday constitutes our profit today in many cases. In this connection the technical man can render a real service to his employer, and his state, by spotting the leaks and reducing those extra profits now running into the river to the lowest possible figure.

# A New Speed Regulator for Paper Machine Drive*

By R. R. Baker[1]

The modern trend in industries is to equip the manufacturing plants with more effective and efficient machines. In most cases these improvements not only apply to the machines but also to the drives for these machines. In fact the effectiveness of a machine depends largely upon its drive and control. Recently the Westinghouse Company developed a speed regulator for sectional paper machine drive which materially improves the performance and reduces the attention and maintenance required with this type of drive.

Some ten years ago the only form of drive applied to paper machines was known as a mechanical drive. In most cases with such a drive, manipulation of the various sections of the machine depended upon the use of some type of clutch between the main driving member and the individual section, and power was transmitted to each section of the machine through at least three friction contacts, i. e., the two belt contacts on the cone pulley and the friction contact of the clutch.

Such a drive was difficult to control as it was necessary to manipulate the clutches each time a section was started, stopped, or operated at slow speed. Frequent use of the clutch, particularly on the heavier sections of the machine resulted in excessive wear and slippage. Then, too, as it was necessary to adjust the speed of the various sections for the purpose of adjusting the draw or to take care of changes in roll diameter, power was transmitted to each section through flat belts operating over cone pulleys. Operating in this manner, the belt is, of course, only effective over a very small area near its center and unless it is operated at a very high initial tension excessive slippage will occur. Both the friction clutch and belt must be constantly kept in first class condition and adjustment to permit operating the paper machine economically or with a reasonable degree of safety.

To overcome these and other fundamental limitations of mechanical drive, sectional individual motor drive was developed. With the sectional drive, individual d. c. motors drive the various sections of the machine. The use of control equipment whereby each motor may be started, stopped, or operated at low speed without interfering with the operation of the balance of the machine, does away with the clutches. Automatic speed regulation of the individual d. c. motors does away with the cone pulleys and belt drive. Slippage between the driving and driven member is impossible as the one is rigidly coupled to the other.

There are three principal types of sectional paper machine drives in use at the present time. Each of these types maintain speed regulation of the d. c. motor by automatic adjustment of the excitation of d. c. motor fields. The field control mechanisms are, in each case, actuated by means of speed differentials. The speed of each section motor is maintained with respect to a master reference speed. Any momentary variation from this adjusted speed is immediately detected by the differential and correction automatically made through adjustment of the motor excitation by means of movement of the differential.

A speed regulator of this type should have certain fundamental characteristics which enable it to best meet the exacting requirements of a paper machine drive.

First, the regulator should be capable of adjusting the motor field excitation to the exact value as required by the operating speed and load of the motor. In other words, it should be capable of an infinite number of adjustments between the minimum and maximum required motor excitation, as otherwise it is necessary for the section motor to oscillate between two speeds,—neither of which is, exactly correct. Such speed oscillations result in variations in draw between sections, which is, of course, extremely undesirable in paper machine operation. This condition can only be avoided by providing a regulator which has an infinite number of adjustments between the minimum and the maximum motor excitation.

Second, the regulator should be extremely rapid in its response to a demand for a change in excitation. The rapidity of this response is a direct measure of the degree of angular displacement between the master or reference speed and the speed of the section on which the disturbance occurs. When the response is rapid the angular displacement is small. When the response is slow the angular displacement is large. Let us consider what this means with regards to the performance of the paper machine. A large angular displacement on any section means excessive stretch in the sheet on one side of the section and slack on the other side. These conditions cannot be tolerated on a paper machine as they tend to tear the sheet on one side and wrinkle it on the other. An effective regulator must entirely eliminate these difficulties and its ability to accomplish these results depends almost entirely upon the rapidity of its response.

Third, the regulator should be provided with means for differentiating between suddenly applied and slowly applied loads. To prevent excessive changes in speed and large angular displacement

* Presented at fall meeting of TAPPI, Richmond, Va., Sept. 24, 1929.
[1] Engineer, Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

as the result of suddenly applied load, the corrective action of the regulator must be drastic, in proportion to the suddenness of the applied load, and independent of the amplitude of the differential action of the regulator.

Fourth, the regulator, as it operates on the principle of a speed differential, should be entirely free from back lash or lost motion, as either of these occuring in any of the regulator parts permit of angular displacement without any corresponding corrective effect.

Fifth, the regulator should be rugged in construction and have as few wearing parts as is consistent with effective design so that after being placed in operation it will continue to operate with a minimum of attention or maintenance.

The speed regulator which the Westinghouse Company has recently developed for sectional paper machine drive incorporates all of these features enumerated and it is, therefore, an ideal type of regulator to apply to this extremely exacting duty.

This regulator includes two major parts, the speed differential and the control panel. The speed differential includes a small fractional horsepower synchronous motor, a cone pulley, a worm and nut with suitable bearings, and, a lever system. The synchronous motor has a double extended hollow shaft, the front extension supporting the cone pulley and the rear extension supporting the differential mechanism. The worm of the differential is free to move longitudinally along the hollow shaft, but is held in a definite angular position with respect to the shaft by means

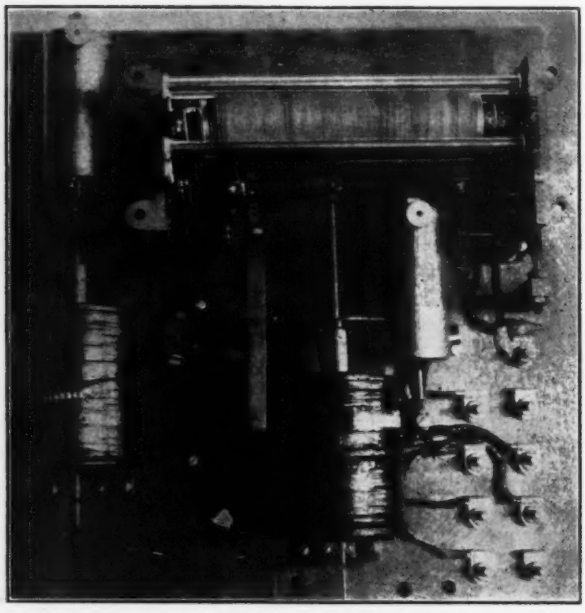


FIG. 2.

**Control panel showing assembly of carbon piles, slow and quick response lever systems, and anti-hunting features.**

of a spline key. The nut within which the worm rotates, is held in a definite longitudinal position with respect to the hollow shaft by means of a ball bearing mounted on the shaft, but is free to rotate about this shaft. The nut is driven by the cone pulley mounted on the other shaft extension of the synchronous motor through an inner shaft.

The synchronous motor driving the worm through the hollow shaft serves as the speed reference of the differential, and the nut driven by the section through the cone pulley and inner shaft, as the regulated member of the differential. During normal operation both the hollow shaft and the inner shaft rotate in the same direction and at the same speed. Any momentary difference in speed between these two members causes an angular displacement between the worm and nut which forces the worm to move longitudinally along the hollow shaft. This movement of the worm serves to rotate the main control shaft of the differential through a yoke linkage.

This entire equipment is mounted in ball bearings and the differential parts are totally enclosed and operate in a bath of oil. All parts are accurately machined and the clearances held within such limits as to practically eliminate all back lash or lost motion. This differential unit is carefully tested and adjusted before leaving the factory and after being set up and filled with oil to the proper level, may be operated for periods of from six months to a year without inspection. The unit is self-contained and there are no

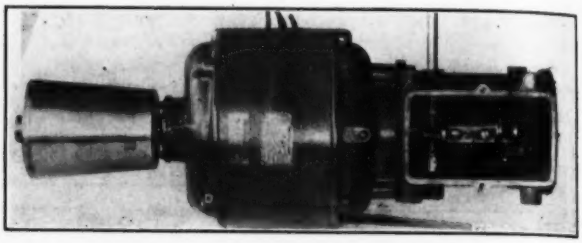


FIG. 1.

**View of synchronous motor, speed differential and cone pulley with differential cover removed.**

mechanical connections or alignments (which are necessary to assure its proper functioning) to be made or maintained in the field.

The control panel consists essentially of two carbon piles supported from a common frame, two levers with balancing springs, acting upon the carbon piles, two dash pots, one for each of the levers, two coils with their cores connected to one of the lever systems, a differential arm which is mounted on an extension of the main control shaft and to which the levers are attached. These items are all mounted in a compact manner on a panel which is enclosed with a sheet metal cover, which serves as a protection against water.

The carbon piles which consist of two stacks of thin carbon discs are connected in series with the motor field and serve to automatically adjust the motor excitation. The resistance of these discs, in accordance with well-known principles, depends upon the pressure applied to them and therefore the exact excitation required to meet any particular speed and load can be obtained by the application of the correct pressure. The adjustment of the motor excitation is not limited to a definite number of steps as it is with other types of speed regulators employing some form of step-by-step rheostat.

The operation of the control is as follows:—when the differential arm is moved either up or down, as a result of the rotation of the control shaft, it operates both of the lever systems through the attached linkages. An upward movement tends to open the carbon piles and a downward movement tends to compress the piles. By a suitable arrangement of the linkages the movement of one of the lever systems and its consequent effect on the compression of the carbon piles, is many times greater than that of the other, but is however only of a transient duration.

The lever system on which the large movement takes place is referred to as the quick-response element. The other as the slow-response. The movement which takes place on the slow-response end represents a permanent adjustment of the carbon piles for each position of the differential arm. This however, is not the case with the quick response element. This lever system is centered by means of two balance springs and its final position remains approximately the same for all positions of the differential arm. Movement of the differential arm is transmitted to the quick-response lever system through a dash pot, so that the effect on the carbon piles, although very drastic for a sudden movement of the differential arm, is only of a transient nature and is removed when the centering springs have returned the system to the balanced position.

### Anti-Hunting Feature

The control element is provided with an anti-hunting feature which is essential on all quick-response regulators. The anti-hunting element is applied to the slow-response lever system and consists of two coils, one of which is in the armature and the other in the field circuit of the motor. For example, when a sudden load is thrown on any section of the machine, the differential arm of the regulator swings up rapidly, applying a corrective action through the slow-response element and a more drastic field forcing action through the quick-response element. The armature current of the motor increases as its field current is reduced and to prevent over-traveling and consequent hunting, this corrective action must be relieved. The increased current through the armature coil and the decreased current through the field coil of the regulator, both serve to accomplish this, and is what has been termed as the "anti-hunting" feature.

By the use of the anti-hunting features, together with the quick-response element of the control which serves to force the motor field and which applies a corrective action in direct relation to the suddenness of the applied load, this regulator is able to meet either suddenly or gradually applied loads with a minimum of angular displacement, a condition which is essential to the best operation of the paper machine. These quick-response and anti-hunting features represent an entirely new development in connection with differential speed regulation.

Several years have been spent in the development of this regulator, following which nearly a year's commercial operation has been obtained in the field on a paper machine equipped with this type of regulator. Shop tests have included the control of d. c. motors of all sizes under all conditions of load and with various connected flywheel effects. Field tests have also been run with these regulators on a number of different types of paper machines and for the past several months, one of these regulators has been in operation on the drier section of a wide news machine operating at over 1000 ft. per minute. The results obtained from both the shop and field tests have been highly satisfactory and in all cases these new regulators have given perfect performance with substantially no maintenance attention.

The outstanding advantages of this new development is the ability of this regulator to make exceedingly quick response to any changes without hunting or instability and its freedom from maintenance or attention of any kind.

# Current Paper Trade Literature

## Abstracts of Articles and Notes of Papermaking Inventions Compiled by the Committee on Abstracts of Literature of the Technical Association of the Pulp and Paper Industry

Clarence J. West, Chairman

### Pulp Testing

**Viscosity Determination on Wood Cellulose.** L. Rys. Chem. Obzor 1, 83-86 (1926)—Dissolve 3 grams of cellulose in 100 cc. ammoniacal standard copper solution in an atmosphere of indifferent gas. Determine the viscoscity of the clear solution by measuring the time of fall of a glass or steel ball (diameter 3.3 mm. through a column 15 cm. high at a definite temperature. Detailed directions are given. The accuracy is ±15 percent.—C. J. W.

**Determination of Wood Gum in Pulps.** Hermann Bubeck. Papierfabr. 25, 617-620 (1927). An improved procedure for the determination of the wood gum in sulphite pulps is given which yields results in 2-3 hours instead of 2-3 days required by former methods. Five grams of finely disintegrated pulp in a wide-mouth bottle are treated with 100 cc. of five volume-percent sodium hydroxide at 18° for 1-2 hours. The mixture is shaken once. At the end of the extraction time the mixture is filtered, 25 cc. of the filtrate pipetted off and oxidized with an excess of 1.5 normal chromic acid containing sulphuric acid. The solution is diluted to 250 cc. and the excess of chromic acid determined in 50 cc. iodometrically. One cc. of 1.5 normal chromic acid solution equals 10.13 grams wood gum. The degree of disintegration of the pulp and the temperature of the reaction are important factors in this test.—C.J.W.

### Miscellaneous

**Bleaching of Sulphite Cellulose.** L. Rys. Papierfabr. 26, 256-260, 269-289 (1928).—The advantages of bleaching in higher stuff density (increase of reaction velocity, cold bleaching, greater space efficiency, lower power consumption etc.) are discussed and it is shown that by a combined chlorine water hypochlorite bleach and alkaline extraction and unusual degree of purity of color, good chemical properties of the material and about 30 percent economy of chlorine are obtained. The duration of the alkali extraction depends on the temperature and alkalinity of the liquid, milk of lime giving as satisfactory results as sodium hydroxide. In the pre-bleaching about 75 percent of the required total chlorine is used as chlorine water, the remaining 25 percent as hypochlorite, being used in the after-bleaching, which may be catalytically accelerated by the use of metallic chlorides (*e. g.*, copper, cobalt or nickel). The economy of chlorine is ascribed partly to the preliminary alkaline extraction and partly to the use of chlorine water. By this method the alpha-cellulose content is never lower, and the copper number little, if any, higher than corresponding values given by other processes, while a better color is obtained. The relationship between the different degrees of fluorescence in ultraviolet light and the purity of the bleached material is established, comparisons being made both visually and photographically. Pure cellulose has a bluish-violet fluorescence, while the less pure (is) the material the more its color approaches greenish gray to brown. Theoretical and practical grounds for bleaching with hypochlorite in low and high stuff density and for the chlorine water bleach and alkali extraction of the chlorinated incrusting substances are discussed.—C. J. W.

**Use of Starch in Paper.** Hans Wrede. Papierfabr. 26, 301-309 (1928) Comparison is made between the properties of rice, wheat, maize and potato starches from the point of view of sizing in paper manufacture and a method is described for determining the viscosity and adhesive power of starch pastes. Starch is useful not only for improving the sizing and the quality of paper but also as a filling and finishing material. Wheat starch is absorbed by the fibers to the greatest extent but maize is to be preferred on account of its greater gel formation and cheapness. Temperatures of pasting differ for the various starches, but in sizing, instead of pasting, thorough cooking is recommended, with application of the paste to the fibers warm. The addition of nekal BX increases the absorption of the starch by the fibers and assists dyeing, while for papers resistant to moisture and rain, such as poster papers, montan wax should be used. Starch gives greater uniformity and closeness of surface texture and a mixture of starch and water glass is specially useful in this respect. The starch mixture, raw pasted under different conditions (*e. g.*, by means of sodium hyldroxide or by cooking) and in combination with such substances as rosin, sodium silicate, nekal and montan wax, and the effects produced in the finished material, are described for writing, printing, parchment and other papers.—C. J. W.

**Effect of Beating on the Sizing Resistance of Paper.** J. Berger. Papierfabr. 26, 561-565 (1928). The sizing effect resulting solely from beating has been investigated by preparing a range

of bleached sulphite wood papers beaten for varying periods of time in a Lampen mill and comparing them as regards their sizing resistance (measured by various flotation methods) with rosin-sized printing papers of varying degrees of hardness. The results indicate that sizing resistance increases slowly with the degree of beating (wetness) of the pulp up to a point and then rapidly increases with further beating, so that it is possible to prepare beaten sheets which, though containing no added sizing agent, show a better resistance to penetration by aqueous liquids than do fully rosin-sized printing papers of the same weight. In the flotation tests for sizing resistance, the most satisfactory results were obtained with an in ink bath or with a bath containing 0.1 per cent of caustic soda solution, using phenol-phtahalein in mixture with 9 times its weight of powdered sugar as a dry indicator. For soft- sized papers the caustic soda bath gave the more reliable results, but for hard-sized papers an ink bath was preferred owing to the contact of the caustic soda on the sizing agent after prolonged contact.—C. J. W.

**Measurement of the Sizing Strength of Paper.** B. Schapira. Papierfabr. 26,609-617 (1928). Methods of determining the sizing strength of paper are collected, described and classified according to the factor on which the methods depends, thus (1) absorption of ink, (2) absorption of interacting liquids, such as *e. g.* ferric chloride and tannin solutions, (3) electrolytic conductivity and (4) the action of water, *e. g.* in capillary rise or in causing the curling up of floating specimens of the paper. Distinction is made between surface and interior sizing strength and the methods of determining the latter are criticized. The best relative values are given by the dry indicator method of the Bureau of Standards although, with a few exceptions, good agreement is obtained between the results of this and of the curling method. The method of Stöckigt gives fairly uniform results but its error increases in magnitude with increasing sizing strength on account of selective absorption. The electrolytic and ink-floating methods are too unreliable.—C.J.W.

**Degree of Sizing and Finish. H. Schwalbe.** Papierfabr. 25 173-176 (1927). A short review is given of recent methods for determining the sizing of paper. The apparatus of Albrecht is described. The methods of Albrecht and Klemm do not yield comparable results. As a rule the degree of sizing is reduced with increase in finish due of calendering.—C.J.W.

**A Hygrometer for Wood Pulp.** Anon. Pulp Paper Mag. Can. 26, 1754 (Dec. 6, 1928). A brief description of the Anderson hygrometer for use on pulp drying machines. The method is based on the measurement of current transmitted by contact of metal slides resting on the pulp web; but in order to eliminate uneven contact due to the roughness of the web surface caused by the felt marks, contact rollers with needles which prick through the pulp and produce contact with it are used instead of frictional contact slides. This also eliminates trouble due to variable surface, moisture, as the reading will depend on the average moisture content across the entire width of the sheet.—A.P.-C.

**Attachment for Paper Dryers.** A Bellemare. U. S. pat. 1,680,277, Aug. 14, 1928.—Owing to the high speeds at which modern paper machines are run, the rope carriers have a tendency to jump out of their grooves, slip into the narrow space between the dryer heads and machine frame, and become so entangled that they break before the machine can be stopped. In order to prevent this, a series of guide brackets are mounted on the machine frame adjacent each dryer head and arranged in arcs conforming with those portions of the peripheries of the dryers that are in constant contact with ropes. The brackets are so shaped that when the ropes become displaced they simply run on the brackets, and as the path they follow on the latter substantially conforms with that of the grooves, they are not subjected to any severe stresses or strains and the machine can be stopped and the ropes replaced with little loss of time.—A. P.-C.

### Pulp Testing

**Bronze Rod Mill for the Strength Testing of Wood Pulp.** W. F. Moore. U. S. Testing Co., New York. Paper Trade J. 87, No. 21, 59-60 (Nov. 29, 1928).—In order to overcome the disadvantages inherent to the use of the ball mill with the ordinary porcelain jar, comparative tests were carried out using a machined bronze jar with bronze balls, cast iron buckoids and steel rods, respectively. Conclusions: The results using the bronze jar are exactly reproducible, while those with the porcelain jar are not. Samples treated in the bronze jar do not show any increase in ash content after treatment; while in a porcelain jar the ash content increases in proportion to the time of treatment in the jar. Bronze balls are unsatisfactory for use in the bronze jar due to small area of contact. Small and large buckoids are more satisfactory than bronze balls, but are unsatisfactory for commercial strength testing because of the time consumed in hydrating pulp to maximum strength. Steel rods are satisfactory, they are easily reproducible, are uniform in structure, and give the greatest possible area of contact which is essential to rapid hydration. It is believed that it is possible to tell when a pulp has reached maximum strength by means of the freshness test; when this test is expressed as per cent degree of beating, the point maximum strength lies between 45 and 55%. The use of stainless steel instead of ordinary steel rods will improve the accuracy for commercial testing; a slight ash content found in one of the tests proved to be entirely iron rust, which was caused by the rods rusting between runs. The work done to date shows that in using the bronze jar all freeness curves are of the same type, but with different slopes, while using the porcelain jar the freeness curves differ considerably in shape.—A.P.-C.

**Chemical Analysis of Pulps and Pulp Woods. Methods used at the Forest Products Laboratory.** Mark W. Bray. Forest Products Laboratory, Madison, Wisconsin. Paper Trade J. No. 25, 59-68 (Dec. 20, 1928).—Methods are described for sampling, moisture determination (by heating and by distillation with xylene), determination of ash, cold-water solubility, hot-water solubility, solubility in 1% caustic soda and in 10% caustic soda, ether solubility, lignin, alcohol-benzene solubility, cellulose, chlorine consumption, alpha, beta-and gamma-cellulose, copper number acid, methoyxl group, and pentosans.—A.P.-C.

**Measurement of the Viscosity of Groundwood with the Schopper Riegler Apparatus.** Walter Brecht and Erich Schuan. Papier fabr. 25, Fest U. Ausland Heft. 45-60 (1927).—The most favorable conditions for the operation of the Schopper-Riegler apparatus in determining the viscosity of groundwood were investigated. For this purpose a graph is shown in order that all values may be referred to 20° C. Sources of errors and their limits are tabulated. A stock density of 0.3 percent in 1000 cc. of suspension is recommended, with a temperature of 20° C. The preparation of this suspension is facilitated by the preparation of a standard cake of fibers under certain conditions of pressure, namely 44.5 grams per $cm^3$. The calculated amount of this cake to give 3 grams is then used for the suspension. A comparison is drawn with the Canadian standard freeness tester.—C. J. W.

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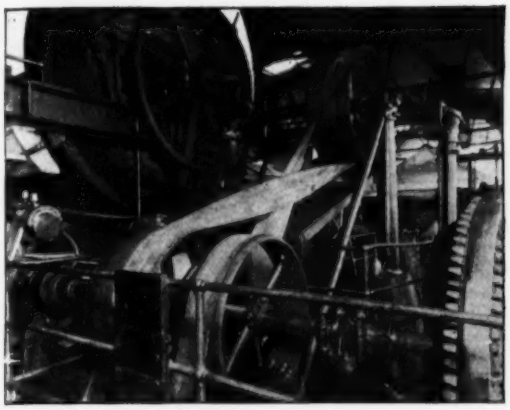
## Robert Gair to Expand Piermont Plant

To meet the demands of rapidly increasing sales of folding boxes and fiber shipping cases, the Robert Gair Company, 420 Lexington avenue, New York, N. Y., will build a large extension to its boxboard mill and fabricating plant at Piermont, N. Y. The new building will be five hundred feet long by two hundred feet wide, four stories in height and of reinforced concrete construction. The plans were drawn by William Higginson, architect, and it is expected that the building will be finished in the late Spring of 1930.

## RHOADS TANNATE WATERSHED LEATHER BELTING



ON A CROSS-BELT CONE DRIVE
Four and a Half Years

ON the above drive rubber and camel hair belts *lasted from five to twenty months.*

After the Rhoads Tannate Watershed Belt, shown in the picture had been on *four years and one month* the management ordered another Tannate Belt for the drive because the belt was showing wear.

The new belt lay in their stock room for nearly six months before it got a chance to replace the old one, which was then cut into narrower widths and used on other drives.

The long life, slight stretch and unusual grip of this Tannate Belt so thoroughly "sold" this company on Tannate that they now have more than fifty Rhoads Tannate Watershed belts in their plant.

You, who have not tried Tannate can hardly grasp what it means in less outlay and more output to have Belts like Tannate that last four and a half years instead of twenty months or less. A trial belt on a hard drive will soon help you to know what it really means.

Tannate is always sold under the Rhoads Service Guarantee.

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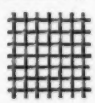

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WILL TEST ALL STOCKS

ASSURES UNIFORM RUNS OF PULP AND PAPER

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UNITED STATES CANADA

# Imports of Paper and Paper Stock

## NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

## NEW YORK IMPORTS

WEEK ENDING SEPTEMBER 28, 1929

### SUMMARY

| | |
|---|---|
| Cigarette paper | 1,843 cs. |
| Wall paper | 12 bls., 25 cs. |
| Paper hangings | 15 bls. 6 cs. |
| News print | 1,160 rolls |
| Printing paper | 80 rolls, 10 bls., 75 cs. |
| Wrapping paper | 63 rolls, 135 cs. |
| Packing paper | 76 cs. |
| Filter paper | 24 bls., 32 cs. |
| Drawing paper | 64 cs. |
| Transparent greaseproof paper | 31 cs. |
| Colored paper | 54 cs. |
| Tissue paper | 194 cs. |
| Condenser tissue | 29 cs. |
| Decalcomania paper | 45 cs. |
| Transfer paper | 4 cs. |
| Baryta coated paper | 180 cs. |
| Surface coated paper | 92 cs. |
| Metal paper | 3 cs. |
| Gold coated paper | 8 cs. |
| Photo paper | 4 cs. |
| Writing paper | 16 cs. |
| Fancy paper | 2 cs. |
| Raw hanging stock | 184 rolls |
| Straw board | 98 rolls |
| Miscellaneous paper | 12 bls., 291 cs. |

### CIGARETTE PAPER

American Tobacco Co., Indep. Hall, Bordeaux, 950 cs.

De Manduit Paper Corp., Indep. Hall, St. Nazaire, 539 cs.

Liggett & Myers Tobacco Co., La Bourdonnais, Bordeaux, 49 cs.

American Tobacco Co., La Bourdonnais, Bordeaux, 300 cs.

F. Murray Hill Co., La Bourdonnais, Bordeaux, 5 cs.

### WALL PAPER

F. J. Emmerich, A. Ballin, Hamburg, 9 bls.

Guaranty Trust Co., A. Ballin, Hamburg, 12 cs.

F. J. Emmerich, Albertic, Liverpool, 3 bls.

J. E. Bernard & Co., Homeric, Southampton, 4 cs.

A. L. Diament & Co., Homeric, Southampton, 2 cs.

A. C. Dodman, Jr., Inc., Aquitania, Southampton, 7 cs.

### PAPER HANGINGS

W. H. S. Lloyd & Co., Minnewaska, London, 3 cs., 14 bls.

A. C. Dodman, Jr., Inc., Albertic, Liverpool, 1 ble.

Whiting & Patterson Co., Inc., Homeric, Southampton, 3 cs.

### NEWS PRINT

Perkins, Goodwin & Co., A. Ballin, Hamburg, 40 rolls.

Perkins, Goodwin & Co., Cleveland, Hamburg, 429 rolls.

Journal of Commerce, Cleveland, Hamburg, 65 rolls.

Parsons & Whittemore, Inc., Berlin, Bremen, 559 rolls.

A. S. Zabriskie, Pres. Harding, Bremen, 67 rolls.

### PRINTING PAPER

Keuffel & Esser Co., Reliance, Hamburg, 80 rolls.

Walker, Goulard, Plehn Co., A. Ballin, Hamburg, 10 bls., 75 cs.

### WRAPPING PAPER

C. Steiner, A. Ballin, Hamburg, 23 cs.

Sylvania Industrial Corp., Arabic, Antwerp, 108 cs.

Steffens Jones Co., Arabic, Antwerp, 4 cs.

Chemical Bank & Trust Co., Drottningholm, Gothenburg, 63 rolls.

### PACKING PAPER

American Express Co., A. Ballin, Hamburg, 54 cs.

Atlantic Forwarding Co., A. Ballin, Hamburg, 22 cs.

### FILTER PAPER

H. Reeve Angel & Co., Inc., Minnewaska, London, 16 cs.

C. Schleicher Schull Co., Cleveland, Hamburg, 16 cs.

Blackman & Blackman, La Bourdonnais, Bordeaux, 24 bls.

### DRAWING PAPER

H. Reeve Angel & Co., Inc., Minnewaska, London, 12 cs.

Keuffel & Esser Co., Carmania, London, 1 cs.

Keuffel & Esser Co., Reliance, Hamburg, 49 cs.

G. Reis & Bro., Berlin, Bremen, 2 cs.

### TRANSPARENT GREASEPROOF PAPER

Central Hanover Bank & Trust Co., A. Ballin, Hamburg, 31 cs.

### COLORED PAPER

S. Gilbert, Dresden, Bremen, 10 cs.

J. Beckhard, Dresden, Bremen, 22 cs.

E. Henningson, Dresden, Bremen, 1 cs.

E. Henningson, America, Bremen, 3 cs.

W. Bersch, America, Bremen, 8 cs.

J. E. Bernard & Co., Pres. Harding, Bremen, 8 cs.

E. Henningson, Pres. Harding, Bremen, 2 cs.

### TISSUE PAPER

F. C. Strype, Franconia, Liverpool, 7 cs.

Meadows, Wye & Co., Franconia, Liverpool, 4 cs.

G. W. Sheldon & Co., Minnewaska, London, 3 cs.

Old Master Paper & Pulp Co., A. Ballin, Hamburg, 57 cs.

Old Master Paper & Pulp Co., Reliance, Hamburg, 92 cs.

Standard Products Corp., Aquitania, Southampton, 31 cs.

### CONDENSER TISSUE

Meadows, Wye & Co., Franconia, Liverpool, 4 cs.

Parsons & Whittemore, Inc., Franconia, Liverpool, 25 cs.

### DECALCOMANIA PAPER

B. F. Drakenfeld & Co., Franconia, Liverpool, 20 cs. (duplex).

Brown Bros. & Co., A. Ballin, Hamburg, 4 cs.

L. A. Consmiller, Pres. Harding, Bremen, 4 cs.

C. W. Sellers, Pres. Harding, Bremen, 12 cs.

C. W. Sellers, Reliance, Hamburg, 5 cs.

### TRANSFER PAPER

F. L. Kramer & Co., Berlin, Bremen, 4 cs.

### BARYTA COATED PAPER

Globe Shipping Co., Dresden, Bremen, 160 cs.

Globe Shipping Co., Berlin, Bremen, 20 cs.

### SURFACE COATED PAPER

P. C. Zuhlke, Dresden, Bremen, 72 cs.

P. C. Zuhlke, Arabic, Antwerp, 20 cs.

### METAL PAPER

H. W. Robinson Co., Cleveland, Hamburg, 3 cs.

### GOLD COATED PAPER

F. Murray Hill Co., Berlin, Bremen, 8 cs.

### PHOTO PAPER

J. J. Gavin, Aquitania, Southampton, 4 cs.

### WRITING PAPER

Globe Shipping Co., Ile de France, Havre, 1 cs.

The Eleto Co., Ile de France, 4 cs.

Globe Shipping Co., Aquitania, Southampton, 5 cs.

R. H. Macy & Co., Aquitania, Southampton, 5 cs.

Stern Steiner & Co., Aquitania, Southampton, 1 cs.

### FANCY PAPER

Hensel, Bruckman & Lorbacher, De Grasse, Havre, 2 cs.

### RAW HANGING STOCK

F. & R. Trading Corp., America, Bremen, 184 rolls.

### STRAW BOARD

Perkins, Goodwin & Co., Rotterdam, Rotterdam, 98 rolls.

### MISCELLANEOUS PAPER

Steiner Paper Corp., Rotterdam, Rotterdam, 49 cs.

Beekman Paper & Card Co., Inc., Rotterdam, Rotterdam, 6 cs.

Miller & Wright Paper Co., Rotterdam, Rotterdam, 2 cs.

F. C. Strype, Dresden, Bremen, 2 cs.

Standard Products Corp., De Grasse, Havre, 120 cs.

R. Wilson Paper Corp., California, Glasgow, 12 bls.

Standard Products Corp., Ile de France, Havre, 35 cs.

Japan Paper Co., Ile de France, Havre, 5 cs.

Distinctive Writing Paper Co., Ile de France, Havre, 2 cs.

J. Beckhard, Ile de France, Havre, 19 cs.

Cheramy, Inc., Ile de France, Havre, 6 cs.

Keller Dorian Paper Co., Ile de France, Havre, 39 cs.

Thomas & Pierson, Aquitania, Southampton, 2 cs.

Japan Paper Co., Aquitania, Southampton, 3 cs.

Fish Shurman Corp., Reliance, Hamburg, 1 cs.

### RAGS, BAGGINGS, ETC.

Castle & Overton, Inc., Estrella, Barcelona, 90 bls. rags.

W. Schall & Co., Estrella, Barcelona, 89 bls. rags.

W. Schall & Co., Estrella, Valencia, 52 bls. rags.

National City Bank, J. Jadot, Antwerp, 15 bls. rags.

Van Oppen & Co., Rotterdam, Rotterdam, 35 bls. paper stock.

Chase National Bank, Rotterdam, Rotterdam, 46 bls. paper stock.

Overton & Co., Rotterdam, Rotterdam, 451 bls. bagging.

G. W. Millar & Co., Rotterdam, Rotterdam, 56 bls. rags.

Anglo South American Trust Co., Dresden, Bremen, 73 bls. jute waste.

Fidelity Trust Co., Clara, Bari, 43 bls. rags.

J. Cohen & Son, Franconia, Liverpool, 16 bls. paper stock.

M. Snedeker Corp., Franconia, Liverpool, 75 bls. thread waste.

Baring Bros. & Co., Vulcania, Alexandria, 227 bls. rags.

Irving Trust Co., Vulcania, Alexandria, 150 bls. rags.

Amsinck, Sonne & Co., Inc., Vulcania, Alexandria, 90 bls. rags.

Castle & Overton, Inc., United States, Copenhagen, 90 bls. bagging.

Castle & Overton, Inc., United States, Copenhagen, 58 bls. rags.

Equitable Trust Co., United States, Copenhagen, 1,092 bls. rags.

Amtorg Trading Corp., United States, Copenhagen, 364 bls. rags.

A. W. Fenton, Inc., Indep. Hall, Bordeaux, 655 bls. rags.

J. Cohen & Son, Indep. Hall, Bordeaux, 7 bls. rags.

R. F. Downing & Co., Indep. Hall, St. Nazaire, 31 bls. rags.

Castle & Overton, Inc., Californie, Havre, 35 bls. bagging.

Castle & Overton, Inc., Californie, Havre, 8 bls. woolens.

V. Galaup, Californie, Havre, 44 bls. new cuttings.

V. Galaup, Californie, Havre, 38 bls. rags.

Darmstadt, Scott & Courtney, Austvard, Genoa, 102 bls. fleshings.

Darmstadt, Scott & Courtney, Austvard, Genoa, 98 bls. bagging.

Phila. National Bank, Austvard, Genoa, 124 bls. bagging.

E. J. Keller Co., Inc., Austvard, ——, 50 bls. linen threads.

Leigh Textile Co., Austvard, Barcelona, 154 bls. cotton waste.

Leshner Paperstock Corp., Austvard, Barcelona, 135 bls. bagging.

S. Birkenstein & Son, Austvard, Barcelona, 109 bls. rags.

Chemical Bank & Trust Co., Austvard, Barcelona, 184 bls. rags.

P. Berlowitz, Austvard, Barcelona, 158 bls. rags.

P. Berlowitz, Austvard, Barcelona, 45 bls. bagging.

National City Bank, Austvard, Malaga, 56 bls. rags.

E. Butterworth & Co., Inc., Sacandaga, Antwerp, 130 bls. flax waste.

W. Steck & Co., Saco, Rotterdam, 24 bls. cotton waste.

W. Schall & Co., A. Ballin, Hamburg, 301 bls. cotton waste.

Castle & Overton, Inc., A. Ballin, Hamburg, 5 bls. rags.

D. M. Hicks, Inc., Arabic, Antwerp, 208 bls. flax waste pulp.

W. Schall & Co., Cleveland, Hamburg, 52 bls. cotton waste.

A. W. Fenton, Inc., Cleveland, Hamburg, 112 bls. rags.

Castle & Overton, Inc., Cleveland, Hamburg, 6 bls. rags.

Brown Bros. & Co., California, Glasgow, 53 bls. rags.

C. R. Spence & Co., California, Glasgow, 62 bls. rags.

Castle & Overton, Inc., California, Glasgow, 57 bls. rags.

Castle & Overton, Inc., California, Glasgow, 49 bls. bagging.

S. Birkenstein & Son, California, Glasgow, 56 bls. rags.

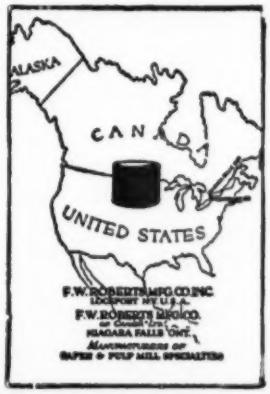
*(Continued on page 92)*

**GEORGE SHEVLIN AND**
**The TRIMBEY-SHEVLIN "Junior"**

**This "Junior" screens 40 tons G. W. using .065 plates using but 15 H.P. The TRIMBEY-SHEVLIN "Senior" handles 80 tons with 25 H.P.**

**TRIMBEY MACHINE WORKS**
**Glens Falls, N. Y.**

**BURRS**




**BURRS**

**Perforated Metal Screens**
**for every purpose**

also elevator buckets of all kinds; chutes; hoppers; stacks and tanks. MITCO Products — Interlocked Steel Grating; Shur-Site Stair Treads; Armorgrids.

**HENDRICK MANUFACTURING CO.**
50 Dundaff St., Carbondale, Pa.
New York: 30 Church St. Pittsburgh: Union Trust Bldg.

ask us
THE PUSEY AND JONES CORPORATION
*Established 1848. Builders of Paper-making Machinery*
[NEWS-PRINT BOOK PAPER KRAFT BOARD]
*Wilmington, Delaware, U.S.A.*

# St. Regis Paper Company

*Daily Capacity, 525 Tons*

Newsprint
Catalog and Directory
Packers Oiled Manila
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*General Sales Office*
15 BROAD STREET
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**Appleton**
**Felts and Jackets**

**E. D. JONES & SONS CO.,**
**PITTSFIELD, MASS.**
MANUFACTURERS OF
**PAPER MILL MACHINERY**

# Imports of Paper and Paper Stock

*(Continued from page 90)*

G. M. Graves Co., California, Glasgow, 34 bls. rags.
E. Butterworth & Co., Inc., Gitano, Antwerp, 127 bls. flax waste.
Equitable Trust Co., Gitano, Antwerp, 121 bls. flax waste.
G. W. Millar & Co., Gitano, Antwerp, 142 bls. rags.
French American Banking Corp., Exton, Leghorn, 47 bls. rags.

OLD ROPE

International Purchasing Co., Rotterdam, Rotterdam, 67 coils.
Irving Trust Co., Rotterdam, Rotterdam, 100 coils.
W. Schall & Co., Rotterdam, Rotterdam, 86 coils.
——, Estrella, Barcelona, 58 coils.
Banco Com'l Italiane Trust Co., Vulcania, Trieste, 51 rolls.
Brown Bros. & Co., United States, Copenhagen, 207 coils.
Banco Com'l Italiane Trust Co., Austvard, Leghorn, 55 coils.
W. Steck & Co., Austvard, Marseilles, 96 coils.
International Purchasing Co., Austvard, Barcelona, 109 coils.
Van Stallic & Co., Saco, Rotterdam, 52 coils.
Brown Bros. & Co., A. Ballin, Hamburg, 34 bls.
Brown Bros. & Co., Cleveland, Hamburg, 62 coils.
Brown Bros. & Co., Boston City, Bristol, 99 coils.
American Rag Trading Co., Gitano, Hull, 24 coils.
W. Steck & Co., Gitano, Hull, 66 coils.
Brown Bros. & Co., Reliance, Hamburg, 31 coils.

CASEIN

Casein Mfg. Co., Rotterdam, Rotterdam, 100 bags.
Trust Co. of North America, Corsican Prince, Buenos Aires, 417 bags.
A. Hurst & Co., De Grasse, Havre, 134 bags.
Atterbury Bros., Inc., American Legion, Buenos Aires, 834 bags.
Kalbfleisch Corp., American Legion, Buenos Aires, 384 bags.
National City Bank, American Legion, Buenos Aires, 250 bags.

WOOD PULP

Castle & Overton, Inc., Cleveland, Hamburg, 1,055 bls. wood pulp, 158 tons.
Chemical Bank & Trust Co., Cleveland, Hamburg, 380 bls. sulphite, 76 tons.
——, Cleveland, Hamburg, 495 bls. wood pulp, 99 tons.
E. M. Sergeant & Co., Bergensfjord, Oslo, 150 bls. wood pulp.
Atterbury Bros., Inc., Bergensfjord, Oslo, 500 bls. wood pulp.
Johanson, Wales & Sparre, Inc., Drottningholm, Gothenburg, 750 bls. sulphate.
E. M. Sergeant & Co., Drottningholm, Gothenburg, 449 bls. dry soda pulp.
Price & Pierce, Ltd., Drottningholm, Gothenburg, 1,625 bls. wood pulp.
Bulkley, Dunton & Co., Drottningholm, ——, 900 bls. wood pulp.
E. M. Sergeant & Co., Slemmestad, Hernosand, 1,200 bls. sulphite, 200 tons.
J. Andersen & Co., Slemmestad, Hernosand, 5,746 bls. sulphite, 990 tons.
J. Andersen & Co., Slemmestad, Hernosand, 3,750 bls. sulphate, 750 tons.
J. Andersen & Co., Slemmestad, Stugsund, 1,000 bls. sulphite, 200 tons.
Price & Pierce, Ltd., Slemmestad, Stugsund, 950 bls. sulphite, 158 tons.
Bulkley, Dunton & Co., Slemmestad, ——, 15,250 bls. wood pulp, 2,895 tons.
O. E. Kiaer, Malaren, Stockholm, 600 bls. wood pulp.
Johanson, Wales & Sparre, Inc., Malaren, Gothenburg, 1,000 bls. sulphate.

WOOD PULP WADDING

Birn & Wachenheim, Rotterdam, Rotterdam, 100 bls.

WOOD PULP BOARDS

Lakerloef Trading Co., Malaren, Helsingfors, 166 bls.

WOOD FLOUR

B. L. Soberski, Rotterdam, Rotterdam, 2,000 bags.
State Chemical Co., Rotterdam, Rotterdam, 900 bags.
A. Kramer & Co., Inc., Rotterdam, Rotterdam, 300 bags.
The Burnet Co., Saco, Rotterdam, 738 bags.
B. L. Soberski, Bergensfjord, Frederickstad, 3,450 bags.
Innes Speiden & Co., Drottningholm, Gothenburg, 726 bags.

## BALTIMORE IMPORTS

WEEK ENDING SEPTEMBER 28, 1929

Congoleum Nairn Co., Indep. Hall, Bordeaux, 782 bls. rags.
V. Galaup, Indep. Hall, Bordeaux, 38 bls. rags.
S. Shapiro & Sons, Indep. Hall, St. Nazaire, 70 bls. rags.
Congoleum Nairn Co., Indep. Hall, St. Nazaire, 52 bls. rags.
V. Galaup, Indep. Hall, St. Nazaire, 79 bls. rags.
Guaranty Trust Co., Californie, Havre, 280 bls. rags.
Congoleum Nairn Co., Exton, Marseilles, 448 bls. rags.
Bulkley, Dunton & Co., Ala, ——, 51 bls. wood pulp.
Bulkley, Dunton & Co., Greldon, ——, 2,925 bls. wood pulp.
Bulkley, Dunton & Co., Hannover, ——, 3,000 bls. wood pulp.
Bulkley, Dunton & Co., Stureholm, ——, 2,475 bls. wood pulp.

## NORFOLK IMPORTS

WEEK ENDING SEPTEMBER 28, 1929

E. J. Keller Co., Inc., Ala, ——, 46 bls. rags.

## PHILADELPHIA IMPORTS

WEEK ENDING SEPTEMBER 28, 1929

Fidelity Trust Co., Estrella, Barcelona, 77 bls. rags.
Tradesman's Natl. Bank, Estrella, Barcelona, 131 bls. rags.
H. G. Lichtenstein, Estrella, Barcelona, 74 bls. rags.
E. J. Keller Co., Inc., Estrella, ——, 146 bls. rags.
Castle & Overton, Inc., Indep. Hall, Bordeaux, 590 bls. rags.
J. A. Steer & Co., Indep. Hall, Bordeaux, 70 bls. rags.
Katzenstein & Keene, Inc., Indep. Hall, Bordeaux, 162 bls. rags.
C. A. Devlin & Co., Indep. Hall, Bordeaux, 22 bls. rags.
Katzenstein & Keene, Inc., Indep. Hall, St. Nazaire, 102 bls. rags.
P. Berlowitz, Indep. Hall, St. Nazaire, 241 bls. rags.
E. Mayer, Indep. Hall, St. Nazaire, 44 bls. rags.
V. Galaup, Indep. Hall, St. Nazaire, 63 bls. rags.
Castle & Overton, Inc., Indep. Hall, St. Nazaire, 153 bls. rags.
P. Berlowitz, Indep. Hall, St. Nazaire, 143 bls. rags.
Tradesman's Natl. Bank, Californie, Havre, 135 bls. rags.
Southwark Natl. Bank, Californie, Havre, 24 bls. rags.
W. Schall & Co., Californie, Havre, 79 bls. bagging.
Equitable Trust Co., Californie, Havre, 94 bls. rags.
J. A. Steer & Co., Californie, Havre, 50 bls. rags.
Guaranty Trust Co., Californie, Havre, 223 bls. rags.
Phila. National Bank, Sacandaga, Antwerp, 77 bls. rags.
E. Mayer, Sacandaga, Antwerp, 24 bls. rags.
P. Corr & Son, Sacandaga, Antwerp, 64 bls. cotton waste.
City National Bank, Sacandaga, Antwerp, 19 bls. rags.
McBlaine & Co., Sacandaga, Antwerp, 31 bls. rags.
Katzenstein & Keene, Inc., Sacandaga, Antwerp, 263 bls. rags.
J. A. Steer & Co., Boston City, Bristol, 79 coils old rope.
D. I. Murphy, Exton, Leghorn, 149 bls. rags.
Phila. National Bank, Exton, Leghorn, 31 bls. rags.
French American Banking Corp., Exton, Leghorn, 89 bls. rags.
C. B. Richard & Co., Boston City, Bristol, 525 bls. rags.
Equitable Trust Co., Exbrook, Constantinople, 89 bls. rags.
C. J. Webb & Sons, Caledonian, Liverpool, 8 bls. rags.
Anglo South American Trust Co., Caledonian, Liverpool, 85 bls. bagging.
Paper Service Co., Caledonian, Liverpool, 6 cs. writing paper.
Brown Bros. & Co., Caledonian, Manchester, 45 bls. rags.
Irving Trust Co., Caledonian, Manchester, 46 bls. rags.
Pagel, Horton & Co., Inc., Malaren, Gefle, 1,250 bls. sulphate.
Parsons & Whittemore, Inc., Malaren, Gothenburg, 1,800 bls. sulphate.
Parsons & Whittemore, Inc., Malaren, Gothenburg, 1,000 bls. wood pulp.
Parsons & Whittemore, Inc., Malaren, Gothenburg, 838 bls. sulphite.
E. M. Sergeant & Co., Malaren, Gothenburg, 400 bls. sulphite.
Perkins, Goodwin & Co., Malaren, Gothenburg 127 bls. sulphite.
Bulkley, Dunton & Co., Greldon, ——, 1,259 bls. wood pulp.
Castle & Overton, Inc., London Merchant, England, 63 bls. rags.
E. J. Keller Co., Inc., Amasis, ——, 357 bls. wood pulp.
E. J. Keller Co., Inc., Binnendyk, ——, 100 bls. rags.
E. J. Keller Co., Inc., Natirar, ——, 46 bls. rags.

## NEW ORLEANS IMPORTS

WEEK ENDING SEPTEMBER 28, 1929

C. B. Richard & Co., Clara, Trieste, 135 bls. bagging.
C. B. Richard & Co., Clara, Trieste, 146 bls. rags.

## BOSTON IMPORTS

WEEK ENDING SEPTEMBER 28, 1929

J. Andersen & Co., Clara, Trieste, 1,050 bls. wood pulp.
D. M. Hicks, Inc., Sacandaga, Antwerp, 7 bls. jute waste.
E. Butterworth & Co., Inc., Sacandaga, Antwerp, 100 bls. flax waste.
E. Butterworth & Co., Inc., Sacandaga, Antwerp, 156 bls. old pickers.
Forte Dupee Sawyer Corp., Sacandaga, Antwerp, 69 bls. rags.
1st Natl. Bank of Boston, Corsican Prince, Buenos Aires, 503 bags casein, 25,366 kilos.
Brown Bros. & Co., Gitano, Hull, 163 coils old rope.
Fidelity Trust Co., Gitano, Antwerp, 56 bls. rags.
Sapulding Fibre Co., Gitano, Antwerp, 1,049 bls. flax waste.
Spaulding Fibre Co., Gitano, Antwerp, 17 bls. hemp waste.
F. Fawcett, Gitano, Antwerp, 243 bls. flax waste.
American Felt Co., Gitano, Antwerp, 44 bls. flax waste.
Meredith Linen Mills, Gitano, Antwerp, 152 bls. flax waste.
F. Stern, Gitano, Antwerp, 158 bls. rags.
Baring Bros. & Co., Caledonian, Manchester, 220 bls. rags.
E. Butterworth & Co., Inc., Caledonian, Manchester, 184 bags hide cuttings.
E. Butterworth & Co., Inc., Caledonian, Manchester, 5 bls. rags.
Baring Bros. & Co., Caledonian, Manchester, 175 bags hide cuttings.
J. B. Moors & Co., Caledonian, Liverpool, 575 bags hide cuttings.
G. F. Malcolm & Co., Caledonian, Liverpool, 10 cs. tissue paper.
J. T. Lodge, Caledonian, Liverpool, 125 bls. rags.
Pagel, Horton & Co., Inc., Malaren, Gefle, 3,250 bls. sulphate.
Price & Pierce, Ltd., Malaren, Gothenburg, 500 bls. wood pulp.
Brown Bros. & Co., Malaren, Gothenburg, 13 bls., 58 coils old rope.
Scandinavian Pulp Agency, Inc., Malaren, Gothenburg, 5,080 bls. kraft pulp.
Scandinavian Pulp Agency, Inc., Malaren, Gothenburg, 2,251 bls. sulphite.
Perkins, Goodwin & Co., Malaren, Gothenburg, 1,270 bls. kraft pulp.
Perkins, Goodwin & Co., Malaren, Gothenburg, 127 bls. sulphite.
Beech Nut Packing Co., Malaren, Gothenburg, 201 rolls wrapping paper.
J. Andersen & Co., Malaren, Stockholm, 300 bls. sulphite.
Parsons & Whittemore, Inc., Malaren, Stockholm, 240 bls. sulphite.
Castle & Overton, Inc., City of Alton, Holland, 2,890 bls. wood pulp.
Castle & Overton, Inc., Liguria, Germany, 541 bls. wood pulp.
Bulkley, Dunton & Co., Slemmestad, ——, 8,775 bls. wood pulp.

**Cotton and Paper Rolls**
**Super Calenders**
**Friction Calenders**
**Embossing Calenders**
**Hydraulic Presses and Pumps**

*Successors to the Granger Foundry & Machine Co.*

**The Textile-Finishing Machinery Company**
**PROVIDENCE, R. I.**

# LINDSAY FOURDRINIER WIRES

**What counts most with you is not what we say about our wires, but what they do. We make "Spiral Weave" Fourdrinier wires, which prevent grooving of seams, also "Longcrimp" wires for Kraft and News.**

## THE LINDSAY WIRE WEAVING CO.

**14025 Aspinwall Ave.**
**CLEVELAND, OHIO**

*Prompt deliveries made from stocks in*
**NEW YORK**
**BOSTON**
**PHILADELPHIA**
**CHICAGO**

VIKADS MARK

## *Little things count*

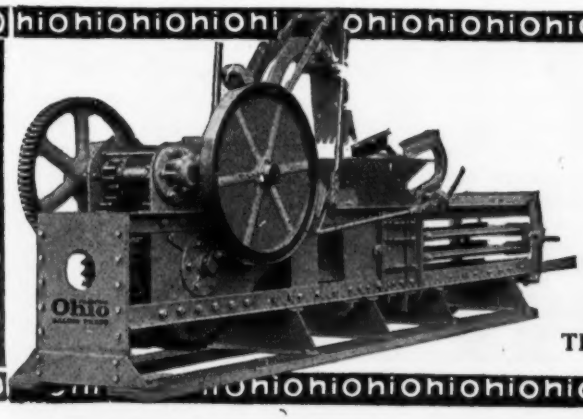
**Of course you expect to receive quality dyestuffs when you order from Heller and Merz. And equally of course you are not disappointed.**

**And it is satisfactory in other ways to do business with us. We are careful in packing, in making prompt shipments, in attention to requests.**

**Little things, perhaps . . . but they count on the profit side.**

**The HELLER & MERZ COMPANY**
**505 Hudson St., New York**

**Boston** 287 Atlantic Ave.
**Chicago** 146 W. Kinzie St.
**Philadelphia** 114 Market St.
**Springfield, Mass.** 40 Albert St.
**Factory—NEWARK, N. J**




**FAMOUS Ohio**
## *BALING PRESSES*

The Famous OHIO Baling Press is speedy. Users of the vertical press find it hard to believe that bales can be put out so quickly. It will bale many times as much scrap as any other baler used for this class of work.

*3 Sizes to meet all requirements*

**THE OHIO CULTIVATOR CO., Bellevue, O.**

## New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, October 2, 1929.

Trading in the local market was moderately active during the past week. Inquiries for future requirements are quite numerous and the immediate outlook is encouraging. Sales forces of the leading paper organizations are in the midst of a strenuous Fall campaign which promises to be highly successful. Prices are holding to previously recorded levels, in most instances.

Production of news print is expanding and the total weighted average output in the United States and Canada last week was approximately 87 per cent of capacity. Shipments were correspondingly heavy and stocks in the hands of the mills are not excessive. With newspaper advertising and circulation steadily increasing the outlook for the future is bright.

Some improvement was noticed in the tone of the paper board market. Stabilized prices are looked for in the near future, in some quarters. The undertone of the fine paper market is stong, with prices generally holding to schedule. Conditions in the coarse paper market are practically unchanged but wrapping paper continues to move in seasonal volume.

### Mechanical Pulp

Demand for both imported and domestic ground wood is fairly persistent. Offerings are rather limited, however, due to curtailed production here and abroad. Shipments against contract are going foward at a normal pace for the time of year. Prices remain steady to firm and there is little talk of concessions around at the present time.

### Chemical Pulp

There have been some slight changes in the chemical pulp market. No. 1 imported strong unbleached sulphite is firmer and is now quoted at from $2.75 to $3.00. No. 2 is selling at from $2.40 to $2.60. Kraft pulp prices are slightly lower. Imported No. 1 kraft is now quoted at from $2.35 to $2.65 and No. 2 at from $2.35 to $2.50. Domestic kraft pulp is selling at from $2.10 to $2.35.

### Old Rope and Bagging

The old rope market is exhibiting a strong undertone and both imported and domestic grades are in excellent demand. Prices are firmer. Foreign manila rope is now quoted at from $4.40 to $4.60. Domestic manila rope is offered at from $4.75 to $5.00. Signs of improvement were noticed in the bagging market. Scrap bagging was fairly active. Roofing bagging was in steady request.

### Rags

Conditions in the domestic rag market are practically unchanged. Mill interest in cotton cuttings appears to be improving slightly. Demand for mixed khaki and fancy shirt cuttings was fairly brisk. Mixed rags continue steady. The foreign rag market is quiet. Dark cottons are now offered at from $1.55 to $1.60 and old shopperies at from $1.50 to $1.55.

### Waste Paper

No radical changes were reported in the paper stock market. The lower grades are beginning to arouse more interest and are slightly firmer, especially folded news. Demand for heavy book stock is more persistent but ledger stock is quiet. Soft white shavings continue to move in satisfactory volume. Inquiries for the various grades of waste paper are numerous and more lively trading is anticipated shortly.

### Twine

The local twine market is in a sound position. Demand for wrapping paper is steadily increasing with the near approach of the Christmas holiday season and this factor is a contributing cause for the optimism expressed by many twine dealers in the immediate future of the industry. Prices generally remain steady and unchanged and shading is infrequent.

## Bids and Awards for Government Paper

WASHINGTON, D. C., October 2, 1929.—The Government Printing Office has received the following bids for 120,000 pounds of white sulphite writing paper in 21 inch rolls: Old Dominion Paper Company, at 5.848 cents per pound; Reese & Reese, 7.05 cents; Dobler & Mudge, 6.1 cents; Whitaker Paper Company, 5.8 cents; American Writing Paper Company, 7.25 cents; Barton, Duer & Koch Paper Company, 6.15 cents; Jessup & Moore Paper Company, 5.85 cents; Walker Goulard Plehn Company, 6.35 and 6 cents; Import Paper Company, 6.85 cents; and Atlantic Paper Company, 6.08 cents.

Reese & Reese have been awarded the contract for furnishing the Printing Office with 15,625 pounds (44,140 sheets) of 26x42—No. 1 rope manila drumhead paper at 18.79 cents per pound, bids for which were received on September 16.

## Reynolds & Reynolds Get Tax Refund

DAYTON, Ohio, September 30, 1929.—The Reynolds & Reynolds Company, manufacturers of blank books, ledgers and other paper products, has been notified that it is entitled to a refund of $23,744 from the Revenue Bureau at Washington because the partnership has overpaid its income and profits taxes in that amount.

Of the amount ordered to be refunded, $12,044 represents an over-assessment previously allowed Reynolds & Reynolds Company for a subsequent year which was credited against a deficiency in 1917 after the expiration of the statutory period allowed for the collection of the deficiency.

The balance of the overpayment, $11,689, is caused by the collection of tax after the expiration of the statutory period of limitations. A hearing in the case was held April 15 last.

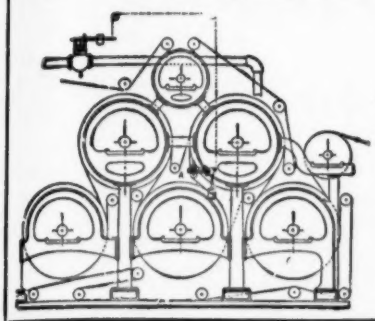
## Unity Paper Mills Damaged by Fire

POTSDAM, N. Y., September 21, 1929.—The Unity Paper Mills were visited by fire during the past week when one of the boilers blew its flues starting a blaze on the roof. The village fire department was called out and aided by the employes soon had the flames under control although serious damage was threatened for a time. The walls of the plant besides the roof were badly damaged and the loss is reported as extensive.

## Marathon Paper Mills Get Tax Refund

WASHINGTON, D. C., October 2, 1929.—The Bureau of Internal Revenue, Treasury Department has announced refund to the Marathon Paper Mills Company, of Rothschild, Wis., for over assessments of income and profits taxes for the year 1917 amounting to $121,153.92 and for the year 1919 amounting to $2,728.27.

The Pickles Drying Regulator



**WE ARE SAFE IN OUR PROPOSITION**

**YOU'LL MAKE NO MISTAKE IN ACCEPTING IT**

# Pickles Drying Regulator

will do everything we claim for it and more. The test costs you nothing until you are satisfied. Many mills tried one and now have every machine equipped. Write for list of users and other information.

**W. F. PICKLES** **Buckland, Conn.**

# The B. QUALITY PULPS

**"HAFSLUND BEAR"**
**Bleached Sulphite**

**"FORSHAGA"**
**Bleached Sulphite**

**"HURUM SPECIAL"**
**Extra Strong Kraft**

**"BAMBLE"**
**Extra Strong Kraft**

***Fresh Monthly Shipments—No Closed Winter Season***

**The Borregaard Company**
Incorporated
**200 FIFTH AVENUE NEW YORK, N. Y.**

# THE DRAPER FELTS

All kinds and styles of Felts for all kinds and styles of Papers.

Write us about your Felt problems and let us help you reduce your Felt Costs—we will call anywhere at any time.

**DRAPER BROS. COMPANY**
**CANTON, MASS.**
***Woolen manufacturers since 1856***

# EASTWOOD
## FOURDRINIER-CYLINDER-WASHER
# WIRES

EASTWOOD WIRE CORPORATION, BELLEVILLE N.J. U.S.A.

# Miscellaneous Market

Office of the PAPER TRADE JOURNAL,
Wednesday, October 2, 1929.

BLANC FIXE.—The blanc fixe market is practically unchanged. Demand for both the pulp and the powder is normal. Prices remain unaltered. The pulp is quoted at from $42.50 to $45.00 per ton, in bulk, while the powder is selling at from 3¾ cents to 4½ cents per pound, in barrels, at works.

BLEACHING POWDER.—Steadiness prevails in the bleaching powder market. While most of the business transacted during the past week was along routine lines, shipments against contract are going forward regularly. Bleaching powder is quoted at from $2.00 to $2.35 per 100 pounds, in large drums, at works.

CASEIN.—The casein market is exhibiting a strong undertone. Domestic casein is now quoted at from 16 cents to 18 cents per pound. Argentine standard ground is selling at from 16 cents to 16½ cents, and finely ground at from 16½ cents to 17 cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—No radical changes were recorded in the caustic soda market. Supplies are moving into consumption in seasonal volume. Prices remain unaltered. Solid caustic soda is quoted at from $2.90 to $2.95 and the flake and the ground at from $3.30 to $3.35 per 100 pounds, in large drums, at works.

CHINA CLAY.—Trading in the china clay market was moderately active. The contract movement was well up to average. Prices remain unchanged. Imported china clay is quoted at from $15 to $25 per ton, ship side, while domestic paper making clay is selling at from $8 to $13 per ton, at mine.

CHLORINE.—Contract shipments of chlorine are going forward to the pulp and paper mills in excellent volume. Prices are holding to schedule. Chlorine is quoted at 3 cents per pound, in tanks, or multi-unit cars, at works, on standard contracts. The spot quotation ranges from 3¼ cents to 3½ cents per pound.

ROSIN.—The rosin market continues to improve and prices are firmer. The grades of gun rosin used in the paper mills are now quoted at from $9.18 to $9.20 per 280 pounds, in barrels, on dock. Wood rosin is still selling at from $7.00 to $8.05 per 280 pounds in barrels, at southern shipping points.

SALT CAKE.—Offerings of salt cake are rather scarce and the market is in a strong position. Inquiries for future needs are being received in good volume. Prices rule firm. Salt cake is quoted at from $17 to $21 per ton, while chrome salt cake is selling at from $14 to $15 per ton, in bulk, at works.

SODA ASH.—The soda ash market is in a strong position. Supplies are moving in heavy volume for the time of year. Numerous orders for 1930 delivery are being booked. Prices are holding to schedule. Contract quotations on soda ash, in car lots, at works, are as follows: in bags, $1.32½, and in barrels, $1.55.

STARCH.—Mill demand for starch is fairly persistent. Contract shipments are moving at a satisfactory pace for the season. Recently advanced prices are being maintained without difficulty. Special paper making starch is quoted at $3.92 per 100 pounds, in bags, and at $4.19 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA.—Conditions in the sulphate of alumina market are satisfactory. Production is being maintained in sufficient volume to take care of current needs. Prices are steady. Commercial grades are still quoted at from $1.40 to $1.55; iron free at $1.90 to $2.05 per 100 pounds, in bags, at works.

SULPHUR.—Some improvement was noticed in the sulphur market. Prices are holding to schedule. Sulphur is quoted at $18 per ton, at mine, in lots of 1,000 tons, or over, on yearly contracts, and at $20 per ton for any smaller quantity over that period. On spot and near by car loads, the quotation is $21 per ton.

TALC.—The talc market was fairly active during the past week. Contract shipments are going forward to the mills in good volume. Prices are unchanged. Domestic talc is quoted at from $16 to $18 per ton, in bulk, at eastern mines, while imported talc is selling at from $18 to $20 per ton, in bags, ship side.

# Market Quotations

## Paper

(F. o. b. Mill)

| | | |
|---|---|---|
| Ledgers | 11.00 | @38.00 |
| Bonds | 9.00 | @53.25 |
| **Writings—** | | |
| Extra Superfine | 14.00 | @32.00 |
| Superfine | 14.00 | @32.00 |
| Tub sized | 10.00 | @15.00 |
| Engine sized | 8.00 | @11.00 |
| **Book, Cased—** | | |
| S. & S. C. | 6.00 @ | 7.50 |
| M. F. | 5.75 @ | 7.00 |
| Coated and Enamel | 7.50 | @12.00 |
| Lithograph | 7.50 | @12.00 |
| **Tissues—Per Ream—** | | |
| White No. 1 | .75 @ | 1.00 |
| Anti-Tarnish | 1.35 @ | 1.90 |
| Colored | 1.00 @ | 2.00 |
| White No. 2 | .75 @ | .80 |
| Kraft | 1.00 @ | 1.10 |
| Manila | .75 @ | .80 |
| **Kraft—** | | |
| No. 1 Domestic | 6.25 @ | 6.50 |
| No. 2 Domestic | 5.25 @ | 5.50 |
| Southern | 4.25 @ | 4.50 |
| Imported | 6.50 @ | 7.00 |
| **Manila—** | | |
| No. 1 Jute | 9.00 @ | 9.25 |
| No. 2 Jute | 7.75 @ | 8.50 |
| No. 1 Wood | 4.75 @ | 5.25 |
| No. 2 Wood | 4.00 @ | 4.50 |
| Butchers | 3.75 @ | 4.25 |
| **Fibre Papers—** | | |
| No. 1 Fibre | 5.00 @ | 5.50 |
| No. 2 Fibre | 4.75 @ | 5.25 |
| Common Bogus | 2.75 @ | 3.00 |
| Screenings | 3.00 @ | 3.25 |
| Card Middles | 4.00 @ | 5.00 |
| **Glassine—** | | |
| Bleached, basis 25 lbs. | 13.00 | @16.00 |
| Bleached, basis 20 lbs. | 15.00 | @16.00 |

(Delivered New York)

| | | |
|---|---|---|
| **News, per ton—** | | |
| Rolls, contract | 62.00 @ | — |
| Rolls, spot | 62.00 @ | — |
| Sheets | 67.00 @ | — |
| Side Runs | 47.00 | @52.00 |
| **Boards—per ton—** | | |
| News | 37.50 | @40.00 |
| Straw | 52.50 | @55.00 |
| Chip | 35.00 | @37.50 |
| Binders' Boards | 65.00 | @70.00 |
| Sgl. Mla. Ll. Chip | 47.50 | @50.00 |
| Wood Pulp | 80.00 | @85.00 |
| 65 Test Jute Liner | 52.50 @ | — |
| 85 Test Jute Liner | 55.00 @ | — |

## Mechanical Pulp

(On Dock)

| | | |
|---|---|---|
| **No. 1 Imported—** | | |
| Moist | 30.00 | @32.00 |
| Dry | 32.00 | @34.00 |

(F. o. b. Mill)

| | | |
|---|---|---|
| No. 1 Domestic | 26.00 | @30.00 |
| Screenings | 15.00 | @20.00 |

## Chemical Pulp

(On Dock, Atlantic Ports)

| | | |
|---|---|---|
| **Sulphite (Imported)—** | | |
| Bleached | 3.75 @ | 4.25 |
| Easy Bleaching | 3.00 @ | 3.15 |
| No. 1 strong unbleached | 2.75 @ | 3.00 |
| Mitscherlich unbleached | 2.80 @ | 3.25 |
| No. 2 strong unbleached | 2.40 @ | 2.60 |
| No. 1 Kraft | 2.35 @ | 2.65 |
| No. 2 Kraft | 2.30 @ | 2.50 |
| **Sulphate—** | | |
| Bleached | 3.60 @ | 3.85 |

(F. o. b. Pulp Mill)

| | | |
|---|---|---|
| **Sulphite (Domestic)—** | | |
| Bleached | 3.40 @ | 4.75 |
| Easy Bleaching Sulphite | 2.65 @ | 3.00 |
| News Sulphite | 2.50 @ | 2.70 |
| Mitscherlich | 3.00 @ | 3.25 |
| Kraft (Domestic) | 2.10 @ | 3.30 |
| Soda Bleached | 3.10 @ | 3.25 |
| **Sulphate Screenings—** | | |
| Coarse | .75 @ | .95 |
| Refined | 1.65 @ | 1.85 |

## Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

| | | |
|---|---|---|
| **Shirt Cuttings—** | | |
| New White, No. 1 | 11.00 | @11.50 |
| New White, No. 2 | 8.00 @ | 8.50 |
| Silesias No. 1 | 7.50 @ | 8.00 |
| New Unbleached | 11.00 | @11.50 |
| New Blue Prints | 5.25 @ | 5.50 |
| New Soft Blacks | 5.25 @ | 5.75 |
| Blue Overall | 7.50 @ | 8.00 |
| Washables | 4.75 @ | 5.25 |
| Fancy | 5.75 @ | 6.21 |
| Mixed Khaki Cuttings | 4.75 @ | 5.25 |
| Pink Corset Cuttings | 8.00 @ | 8.50 |
| O. D. Khaki Cuttings | 5.15 @ | 5.75 |
| Men's Corduroy | 3.75 @ | 4.25 |
| New Mixed Blacks | 3.50 @ | 3.75 |

Old Rags

| | | |
|---|---|---|
| **White, No. 1—** | | |
| Repacked | 5.50 @ | 6.00 |
| Miscellaneous | 4.50 @ | 5.00 |
| **White, No. 2—** | | |
| Repacked | 3.00 @ | 3.50 |
| Miscellaneous | 2.50 @ | 2.75 |
| St. Soiled, White | 2.00 @ | 2.15 |
| **Thirds and Blues—** | | |
| Repacked | 2.25 @ | 2.50 |
| Miscellaneous | 1.75 @ | 2.00 |
| Black Stockings | 3.25 @ | 3.75 |
| **Roofing Rags—** | | |
| Cloth Strippings | 1.70 @ | 1.80 |
| No. 1 | 1.70 @ | 1.80 |
| No. 2 | 1.55 @ | 1.65 |
| No. 3 | 1.30 @ | 1.40 |
| No. 4 | 1.25 @ | 1.35 |
| No. 5A | .90 @ | 1.05 |

## Foreign Rags

New Rags

| | | |
|---|---|---|
| New Dark Cuttings | 2.50 @ | 3.00 |
| New Mixed Cuttings | 2.75 @ | 3.25 |
| New Light Silesias | 7.00 @ | 7.50 |
| Light Flannelettes | 7.50 @ | 8.00 |
| Unbleached Cuttings | 10.00 | @11.00 |
| New White Cuttings | 10.50 | @11.50 |
| New Light Oxfords | 7.00 @ | 7.50 |
| New Light Prints | 5.50 @ | 6.50 |

Old Rags

| | | |
|---|---|---|
| No. 1 White Linens | 7.50 @ | 8.25 |
| No. 2 White Linens | 5.75 @ | 6.75 |
| No. 3 White Linens | 4.75 @ | 5.25 |
| No. 4 White Linens | 3.00 @ | 3.50 |
| No. 1 White Cotton | 5.50 @ | 6.50 |
| No. 2 White Cotton | 4.50 @ | 5.50 |
| No. 3 White Cotton | 3.00 @ | 4.00 |
| No. 4 White Cotton | 1.90 @ | 2.15 |
| Extra Light Prints | 2.75 @ | 3.25 |
| Ord. Light Prints | 2.25 @ | 2.50 |
| Med. Light Prints | 2.00 @ | 2.10 |
| Dutch Blue Cottons | 2.25 @ | 2.40 |
| French Blue Linens | 2.75 @ | 2.85 |
| German Blue Linens | 2.35 @ | 2.55 |
| German Blue Cottons | 2.15 @ | 2.25 |
| Checks and Blues | 1.85 @ | 2.00 |
| Linings Garments | 1.85 @ | 1.95 |
| Dark Cottons | 1.55 @ | 1.60 |
| Old Shopperies | 1.50 @ | 1.55 |
| New Shopperies | 1.50 @ | 1.60 |
| French Blues | 2.10 @ | 2.25 |

## Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

| | | |
|---|---|---|
| **Gunny No. 1—** | | |
| Foreign | 1.60 @ | 1.70 |
| Domestic | 1.70 @ | 1.75 |
| Wool Tares, light | 1.60 @ | 1.65 |
| Wool Tares, Heavy | 1.60 @ | 1.70 |
| Bright Bagging | 1.60 @ | 1.70 |
| Small Mixed Rope | 1.25 @ | 1.40 |
| **Manila Rope—** | | |
| Foreign | 4.40 @ | 4.60 |
| Domestic | 4.75 @ | 5.00 |
| New Burlap Cut | 2.75 @ | 3.00 |
| **Hessian Jute Threads—** | | |
| Foreign | 3.50 @ | 4.00 |
| Domestic | 3.25 @ | 3.50 |

## Old Waste Papers

(F. o. b. New York)

| | | |
|---|---|---|
| **Shavings—** | | |
| Hard, white, No. 1 | 3.25 @ | 3.50 |
| Hard, white, No. 2 | 2.40 @ | 2.55 |
| Soft, White, No. 1 | 2.60 @ | 2.70 |
| White envelope cuttings | 3.00 @ | 3.50 |
| **Flat Stock—** | | |
| Stitchless | 1.50 @ | 1.60 |
| Overissue Mag. | 1.50 @ | 1.60 |
| Solid Flat Book | 1.40 @ | 1.50 |
| Crumpled No. 1 | 1.00 @ | 1.10 |
| Solid Book Ledger | 2.00 @ | 2.10 |
| Ledger Stock | 1.40 @ | 1.50 |
| New B. B. Chips | .65 @ | .75 |
| **Manilas—** | | |
| New Env. Cut | 2.40 @ | 2.60 |
| New Cuttings | 1.50 @ | 1.75 |
| Extra No. 1 old | 1.25 @ | 1.35 |
| Print | .75 @ | .80 |
| Container | .57½ @ | .60 |
| Bogus Wrapper | .75 @ | .85 |
| Old Kraft Machine Compressed bales | 1.85 @ | 2.00 |
| **News—** | | |
| No. 1 White News | 1.65 @ | 1.75 |
| Strictly Overissue | .75 @ | .80 |
| Strictly Folded | .60 @ | .65 |
| No. 1 Mixed Paper | .45 @ | .50 |
| Common Paper | .30 @ | .34 |

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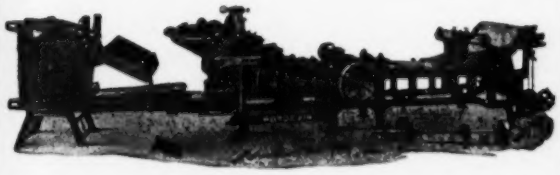

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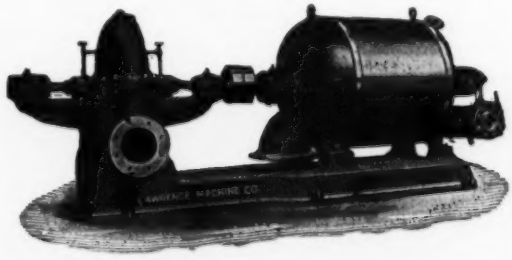

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### Twines
(F. o. b. Mill)

| | | | |
|---|---|---|---|
| Cotton— | | | |
| No. 1 | .39 | @ | .40 |
| No. 2 | .37 | @ | .38 |
| No. 3 | .36 | @ | .37 |
| B. C., 18 basis | .38 | @ | .40 |
| A. B. Italian, 18 basis | .48 | @ | .53 |
| Finished Jute— | | | |
| Dark 18 basis | .24 | @ | .25 |
| Light 18 basis | .27 | @ | .28 |
| Jute Wrapping, 3-6 Ply— | | | |
| No. 1 | .19 | @ | .21 |
| No. 2 | .18 | @ | .20 |
| Tube Rope— | | | |
| 4-ply and larger | .16 | @ | .17 |
| Fine Tube Yarn— | | | |
| 5-ply and larger | .21 | @ | .25 |
| 4-ply | .25 | @ | .29 |
| 3-ply | .28 | @ | .32 |
| Unfinished India— | | | |
| Basis | .13 | @ | .14 |
| Paper Makers Twine Balls | .11 | @ | .12 |
| Box Twine, 2-3 ply | .15 | @ | .17 |
| Jute Rope | .17 | @ | .19 |
| Amer. Hemp, 6 | .29 | @ | .31 |
| Sisal Hay Rope— | | | |
| No. 1 Basis | .16 | @ | .18 |
| No. 2 Basis | .14 | @ | .16 |
| Sisal Lath Yarn— | | | |
| No. 1 | .14 | @ | .16 |
| No. 2 | .12 | @ | .14 |
| Manila Rope | .22 | @ | .24 |

## CHICAGO

### Paper
(F. o. b. Mill)

| | | | |
|---|---|---|---|
| Rag Bond | .30 | @ | .53¼ |
| Water Marked Sulphite Bond | .09 | @ | .12 |
| Sulphite Bond | .06¾ | @ | .11 |
| Superfine writing | .18 | @ | .24 |
| No. 1 fine writing | .14 | @ | .18 |
| No. 2 fine writing | .12 | @ | .14 |
| No. 3 fine writing | .08½ | @ | .12 |
| No. 1 M. F. Book | .06½ | @ | .07¼ |
| No. 2 M. F. Book | .05¼ | @ | .06¼ |
| No. 1 S.&S.C. Book | .06¾ | @ | .07¾ |
| No. 2 S.&S.C. Book | .05¾ | @ | .06½ |
| Coated Book | .07½ | @ | .12 |
| Coated Label | .07½ | @ | .10 |
| No. 1 Manila | .04¼ | @ | .05¼ |
| No. 1 Fibre | .04¾ | @ | .05¼ |
| No. 2 Manila | .04¼ | @ | .04¾ |
| Butcher's Manila | .04 | @ | .04½ |
| No. 1 Kraft | .06¼ | @ | .06½ |
| Southern Kraft | 4.25 | @ | 4.50 |
| No. 2 Kraft | .04 | @ | .04¼ |
| Wood Tag Boards | .04¼ | @ | .06¼ |
| Sulphite Screenings | .03 | @ | .03¼ |
| Manila Tissue— | | | |
| 24x36 Sheet | .07 | @ | .07¼ |
| White Tissue— | | | |
| 20x30 Sheet | .07¼ | @ | .07½ |
| (Delivered Central Territory) | | | |
| News, per ton— | | | |
| Rolls, contract | 62.00 | @ | — |
| Sheets | 67.00 | @ | — |
| Boards, per ton— | | | |
| Plain Chip | 37.50 | @ | 42.50 |
| Solid News | 47.50 | @ | — |
| Solid News | 40.00 | @ | 45.00 |
| Manila Lined Chip | 50.00 | @ | 55.00 |
| Container Lined— | | | |
| 85 Test | 65.00 | @ | 70.00 |
| 100 Test | 70.00 | @ | — |

### Old Papers
(F. o. b. Chicago)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| No. 1 Hard White | 2.20 | @ | 2.25 |
| White Env. Cuttings | 2.40 | @ | 2.50 |
| No. 1 Soft Shavings | 2.00 | @ | 2.10 |
| No. 1 Mixed | .90 | @ | 1.00 |
| No. 2 Mixed | .70 | @ | .75 |
| Ledger & Writings | 1.25 | @ | 1.35 |
| Solid Books | 1.25 | @ | 1.30 |
| Blanks | 1.40 | @ | 1.50 |
| Krafts | 1.60 | @ | 1.75 |
| New Kraft Cuts | 2.15 | @ | 2.25 |
| Manila Envelope Cuttings | 1.65 | @ | 1.75 |
| Ex. No. 1 Manila | 1.30 | @ | 1.45 |
| Print Manila | .75 | @ | .80 |
| Folded News (overissue) | .80 | @ | .85 |
| Old Newspapers— | | | |
| No. 1 | .65 | @ | .70 |
| No. 2 | .60 | @ | .65 |
| Mixed Papers— | | | |
| No. 1 | .60 | @ | .65 |
| Roofing Stocks— | | | |
| (F. o. b. Chicago, net cash) | | | |
| No. 1 | 30.00 | @ | — |
| No. 2 | 28.00 | @ | — |

## PHILADELPHIA

### Paper
(F. o. b. Mill)

| | | | |
|---|---|---|---|
| Bonds | .06 | @ | .40 |
| Ledgers | .09 | @ | .40 |
| Writings— | | | |
| Superfine | .12½ | @ | .18 |
| Extra fine | .18 | @ | .22 |
| Fine | .17 | @ | .26 |
| Fine, No. 2 | .15 | @ | .25 |
| Fine, No. 3 | .10 | @ | .20 |
| Book, M. F. | .05½ | @ | .07 |
| Book, S. S. & C. | .06 | @ | .07½ |
| Book, Coated | .09½ | @ | .16 |
| Coated Lithograph | .07 | @ | .11 |
| Label | .07 | @ | .11 |
| No. 1 Jute Manila | .08 | @ | .09 |
| Manila Sul., No. 1 | .04 | @ | .05½ |
| Manila No. 2 | .03 | @ | .04 |
| No. 2 Kraft | .06 | @ | .06½ |
| No. 1 Kraft | .06½ | @ | .07 |
| Common Bogus | .03½ | @ | .04 |
| (Delivered Philadelphia) | | | |
| News Print Rolls | 62.00 | @ | — |
| Straw Board | 52.50 | @ | 75.00 |
| News Board | 40.00 | @ | 40.00 |
| Chip Board | 38.00 | @ | 40.00 |
| Wood Pulp Board | 85.00 | @ | 95.00 |
| Binder Boards— | | | |
| No. 1, per ton | 75.00 | | |
| No. 2, per ton | 70.00 | | |
| Carload lots | 68.00 | @ | 70.00 |
| Tarred Felts— | | | |
| Regular | 55.50 | @ | 57.00 |
| Slaters (per roll) | .84 | @ | .94 |
| Best Tarred, 1-ply (per roll) | 1.95 | @ | 2.10 |
| Best Tarred, 2-ply (per roll) | 1.50 | @ | 1.60 |
| Best Tarred, 3-ply | 2.00 | @ | 2.25 |

### Domestic Rags (New)
(Price to Mill, f. o. b. Phila.)

| | | | |
|---|---|---|---|
| Shirt Cuttings— | | | |
| New White, No. 1 | .10½ | @ | .11 |
| New White, No. 2 | .07 | @ | .07½ |
| Light Silesias | .07 | @ | .07½ |
| Silesias, No. 1 | .07 | @ | .09 |
| Black Silesia, soft | .05 | @ | .05½ |
| New Unbleached | .10½ | @ | .11 |
| Washable, No. 1 | .04½ | @ | .05 |
| Blue Overall | .07½ | @ | .08 |
| Cottons—According to grades— | | | |
| Washable, No. 2 | .03 | @ | — |
| New Blue | .03 | @ | .03½ |
| Fancy | .05½ | @ | .06 |
| New Black Soft | .05 | @ | .05¾ |
| New Light Seconds | .02½ | @ | .03 |
| New Dark Seconds | 1.85 | @ | 2.00 |
| Khaki Cuttings— | | | |
| No. 1 O. D. | .05½ | @ | .05¾ |
| No. 2 Mixed | .04½ | @ | .04¾ |
| Corduroy | .03 | @ | .03½ |
| New Canvas | .08½ | @ | .09 |
| New Black Mixed | .03¾ | @ | .04½ |

### Bagging
(F. o. b. Phila.)

| | | | |
|---|---|---|---|
| Gunny, No. 1— | | | |
| Foreign | 1.50 | @ | 1.60 |
| Domestic | 1.75 | @ | — |
| Manila Rope | 3.50 | @ | 4.00 |
| Sisal Rope | 1.50 | @ | — |
| Mixed Rope | 1.10 | @ | 1.25 |
| Scrap Burlaps— | | | |
| No. 1 | 1.50 | @ | 1.60 |
| No. 2 | 1.10 | @ | 1.20 |
| Wool Tares, heavy | 3.00 | @ | — |
| Mixed Strings | 1.15 | @ | 1.25 |
| No. 1, New Light Burlap | 2.50 | @ | 2.75 |
| New Burlap Cuttings | 2.00 | @ | 2.25 |

### Old Papers
(F. o. b. Phila.)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| No. 1 Hard White | 3.20 | @ | 3.25 |
| No. 2 Hard White | 2.75 | @ | 3.00 |
| No. 1 Soft White | 2.80 | @ | 2.90 |
| No. 2 Soft White | 1.80 | @ | 1.90 |
| No. 1 Mixed | 1.50 | @ | 1.60 |
| No. 2 Mixed | .90 | @ | 1.00 |
| Solid Ledger Stock | 1.85 | @ | 1.90 |
| Writing Paper | 1.60 | @ | 1.65 |
| No. 1 Books, heavy | 1.40 | @ | 1.50 |
| No. 2 Books, light | 1.05 | @ | 1.15 |
| No. 1 New Manila | 2.40 | @ | 2.50 |
| No. 1 Old Manila | 1.50 | @ | 1.60 |
| Print Manila | .95 | @ | 1.00 |
| Container Manila | .85 | @ | .90 |
| Old Kraft | 2.25 | @ | 2.50 |
| Common paper | .50 | @ | .55 |
| No. 1 Mixed Paper | .60 | @ | .65 |
| Straw Board, Chip | .60 | @ | .65 |
| Binders Board, Chip | .60 | @ | .65 |
| Overissue News | .80 | @ | .85 |
| Old Newspaper | .50 | @ | .55 |

### Domestic Rags (Old)

| | | | |
|---|---|---|---|
| White, No. 1— | | | |
| Repacked | 4.25 | @ | 4.50 |
| Miscellaneous | 3.50 | @ | 3.75 |
| White, No. 2 | 2.00 | @ | 2.25 |
| Thirds and Blues— | | | |
| Repacked | 2.00 | @ | 2.25 |
| Miscellaneous | 1.60 | @ | 1.80 |
| Black Stockings (Export) | 3.90 | @ | 4.25 |
| Roofing Stock— | | | |
| Foreign No. 1 | 1.65 | @ | 1.75 |
| Repacked | .02½ | @ | .02¾ |
| No. 2 | 1.30 | @ | 1.35 |
| No. 3 (Roofing) | 1.15 | @ | 1.25 |
| No. 4 | 1.00 | @ | 1.15 |
| No. 5A | .75 | @ | .85 |
| B | 65 | @ | .75 |
| C | .65 | @ | .75 |

## BOSTON

### Paper
(F. o. b. Mill)

| | | | |
|---|---|---|---|
| Ledgers— | | | |
| Sulphite | .07½ | @ | .15 |
| Rag content | .15 | @ | .30 |
| All rag | .38 | @ | .52½ |
| Bonds— | | | |
| Sulphite | .06½ | @ | .11¾ |
| Rag content | .15 | @ | .30 |
| All rag | .36½ | @ | .65 |
| Writings | .07 | @ | .20 |
| Superfines | .11 | @ | .31 |
| Book, Super | .06 | @ | .09 |
| Book, M. F. | .05¾ | @ | .08¾ |
| Book, Coated | .08½ | @ | .20 |
| Coated Litho | .09 | @ | .12 |
| Label | .09½ | @ | .15 |
| Jute Manila No. 1 | .11 | @ | .13 |
| Manila, Sul. No. 1 | .04¾ | @ | .06¼ |
| Manila, Sul. No. 2 | .03¼ | @ | .04½ |
| No. 1 Kraft | .06¾ | @ | .06½ |
| No. 2 Kraft | .04½ | @ | .05¾ |
| Common Bogus | .02 | @ | .02¾ |
| Delivered New England points | | | |
| News Print Rolls | 61.50 | @ | — |
| Straw Boards, rolls | .009 | | 52.50 |
| Straw Board in Sheets, basis 35s to 70s | 54.50 | @ | 55.00 |
| Filled News Board | 37.50 | @ | 40.00 |
| Chip Board | 35.00 | @ | 37.50 |
| Single Manila Lined Chip | 47.50 | @ | 50.00 |
| Single White, Patent Coated Newsboard | | | |
| Bender | 65.00 | @ | 80.00 |
| Wood Pulp Board | 80.00 | @ | 85.00 |
| Binder Boards | 70.00 | @ | 75.00 |

(F. o. b. Mill)

| | | | |
|---|---|---|---|
| Tarred Felts— | | | |
| Regular, carload lots | 65.00 | @ | — |

### Old Papers
(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| No. 1 Hard White | 3.25 | @ | 3.75 |
| No. 2 Hard White | 2.60 | @ | 2.90 |
| No. 1 Soft White | 2.40 | @ | 2.50 |
| No. 1 Mixed | 1.10 | @ | 1.15 |
| No. 2 Mixed | .85 | @ | .90 |
| Solid Ledger Stock | 2.35 | @ | 2.45 |
| No. 1 Books, Heavy | 1.50 | @ | 1.55 |
| No. 1 Books, Light | — | @ | 1.15 |
| Manila Env. Cuttings | 2.00 | @ | 2.25 |
| No. 1 Old Manila | .90 | @ | 1.00 |
| White Blank News | 1.50 | @ | 1.60 |
| Old Kraft | 1.75 | @ | 1.80 |
| Print Manila | .80 | @ | .90 |
| No. 1 Mixed Paper | .45 | @ | .50 |
| Overissue News | .70 | @ | .75 |
| Old Newspapers | .55 | @ | .57½ |
| Box Board, Chip | .55 | @ | .60 |

### Bagging
(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Gunny No. 1— | | | |
| Foreign | 1.50 | @ | 1.60 |
| Manila Rope— | | | |
| Foreign | 4.25 | @ | 4.75 |
| Domestic | — | @ | 4.25 |
| Transmission Rope | 2.25 | @ | 2.50 |
| Mixed Strings | 1.00 | @ | — |
| Jute Wool Strings | 1.00 | @ | 1.05 |
| Jute Carpet Threads | 1.05 | @ | 1.15 |
| Scrap Burlaps | 1.37½ | @ | 1.50 |
| Scrap Sisal | 1.80 | @ | 2.00 |
| Scrap Sisal for shredding | 1.85 | @ | 2.00 |
| Wool Tares, heavy | 1.60 | @ | — |
| New Burlap Cutting | 1.90 | @ | 2.00 |
| Australian Wool Pouches | 3.00 | @ | 3.12½ |

### Domestic Rags (New)
(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Shirt Cuttings— | | | |
| New White No. 1 | .09½ | @ | .10 |
| Silesias, No. 1 | .06 | @ | .06½ |
| New Unbleached | .10 | @ | .10½ |
| Fancy | .04 | @ | .04½ |
| Washable | .04 | @ | .04½ |
| Cottons—According to grades | | | |
| Blue Overalls | .06¼ | @ | .06¾ |
| New Black, soft | .04 | @ | .04¼ |
| Khaki Cuttings | .04 | @ | .04¼ |
| O. D. Khaki | .05 | @ | — |
| Corduroy | .03 | @ | .03½ |
| New Canvas | .08 | @ | .08½ |

### Domestic Rags (Old)
(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Canvas | .04½ | @ | — |
| White No. 1— | | | |
| Repacked | 4.75 | @ | 5.25 |
| Miscellaneous | 5.00 | @ | — |
| White No. 2— | | | |
| Repacked | .04½ | @ | .05 |
| Miscellaneous | .03½ | @ | .04 |
| Twos and Blues | 2.75 | @ | 3.00 |
| Thirds and Blues— | | | |
| Repacked | 2.50 | @ | — |
| Miscellaneous | 1.75 | @ | 1.90 |
| Black Stockings | — | @ | 4.00 |
| Roofing Stock— | | | |
| No. 1 | 1.65 | @ | 1.75 |
| No. 2 | 1.45 | @ | 1.55 |
| No. 3 | 1.05 | @ | 1.10 |
| No. 4 | 1.10 | @ | 1.15 |

### Foreign Rags
(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Dark Cottons | 1.55 | @ | 1.57½ |
| New No. 1 Shirt Cuttings | 9.00 | @ | 10.00 |
| Dutch Blues | 2.00 | @ | 2 12½ |
| Lace Curtains | 4.75 | @ | 5.00 |
| New Checks & Blues | 4.25 | @ | 4.00 |
| Old Fustians | 1.90 | @ | — |
| Old Linsey Garments | 1.80 | @ | 1.85 |

## TORONTO

### Paper
(F. o. b. Mill)

| | | | |
|---|---|---|---|
| Bond— | | | |
| No. 1 Sulphite | .12½ | @ | — |
| No. 2 Sulphite | .10¾ | @ | — |
| No. 1 Colored | .13½ | @ | — |
| No. 2 Colored | .11¾ | @ | — |
| Ledgers (sulphite) | — | @ | — |
| Ledgers, No. 1 | .36 | @ | — |
| Ledgers, No. 2 | .27 | @ | — |
| Writing | .09½ | @ | .10 |
| Book— | | | |
| No. 1 M. F. (carloads) | 7.50 | @ | — |
| No. 2 M. F. (carloads) | 7.25 | @ | — |
| No. 3 M. F. (carloads) | 7.00 | @ | — |
| No. 1 S. C. (carloads) | 8.00 | @ | — |
| No. 2 S. C. (carloads) | 7.75 | @ | — |
| No. 3 S. C. (carloads) | 7.50 | @ | — |
| No. 1 Coated and Litho | 13.25 | @ | — |
| No. 2 Coated and Litho | 12.25 | @ | — |
| No. 3 Coated and Litho | 11.50 | @ | — |
| Coated tinted | 14.50 | @ | — |
| Wrapping— | | | |
| Rag Brown | 4.95 | @ | — |
| White Wrap | 5.25 | @ | — |
| "B" Manila | 5.80 | @ | — |
| No. 1 Manila | 6.65 | @ | — |
| Fiber | 6.65 | @ | — |
| Kraft, M. F. | 7.00 | @ | — |
| M. G. | 7.00 | @ | — |

(Delivered Toronto)

| | | | |
|---|---|---|---|
| News, per ton— | | | |
| Rolls (contract) | 61.50 | @ | 62.00 |
| Sheets | 67.00 | @ | — |

### Pulp
(F. o. b. Mill)

| | | | |
|---|---|---|---|
| Ground Wood | 30.00 | @ | 31.00 |
| Sulphite easy bleaching | 60.00 | @ | — |
| Sulphite news grade | 60.00 | @ | — |
| Sulphite, bleached | 77.00 | @ | — |
| Sulphate | 60.00 | @ | — |

### Old Waste Paper
(In carload lots, f. o. b. Toronto)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| White Env. Cut | 3.00 | @ | — |
| Soft White Book Shavings | 2.85 | @ | — |
| White Blk. News | 1.60 | @ | — |
| Book and Ledger— | | | |
| Flat Magazine and Book Stock (old) | 1.40 | @ | — |
| Light and Crumpled Book Stock | 1.25 | @ | — |
| Ledgers and Writings | 1.50 | @ | — |
| Solid Ledgers | 1.50 | @ | — |
| Manilas— | | | |
| New Manila Cut | 1.50 | @ | — |
| Printed Manilas | 1.00 | @ | — |
| Kraft | 2.25 | @ | — |
| News and Scrap— | | | |
| Strictly Overissue | .85 | @ | — |
| Strictly Folded | .85 | @ | — |
| No. 1 Mixed Paper | .65 | @ | — |

### Domestic Rags
(Price to mills, f. o. b. Toronto)

| | | | |
|---|---|---|---|
| No. 1 White Shirt Cuttings | .10 | @ | .10½ |
| Fancy Shirt Cuttings | .05½ | @ | — |

Friction at this point can be very expensive.

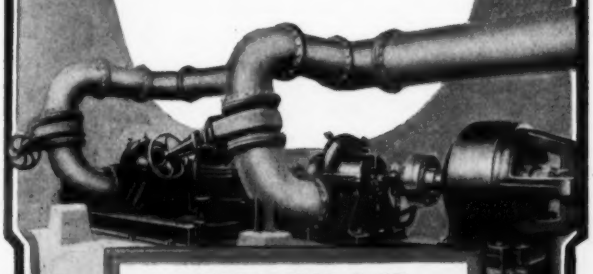
*Solutions of Caustic Soda and similar chemicals will wash out the lubricant from ordinary packings that harden and cut the shaft.*

CUTNO PACKING

**carries in each separate strand a lubricant that successfully resists the cutting action of Caustic Soda and all alkali solutions.**

**To prevent the destruction of shaft friction use "Cutno" packing, that not only has an abundance of lubricant to overcome the usual shaft friction, but also resists the washing out tendency of the chemical solutions with which it comes in contact.**

***Let us send you a working sample to test out under your own conditions. State size of packing desired for test.***



*GREEN, TWEED & CO.*
*Sole Manufacturers*
109 Duane St. New York

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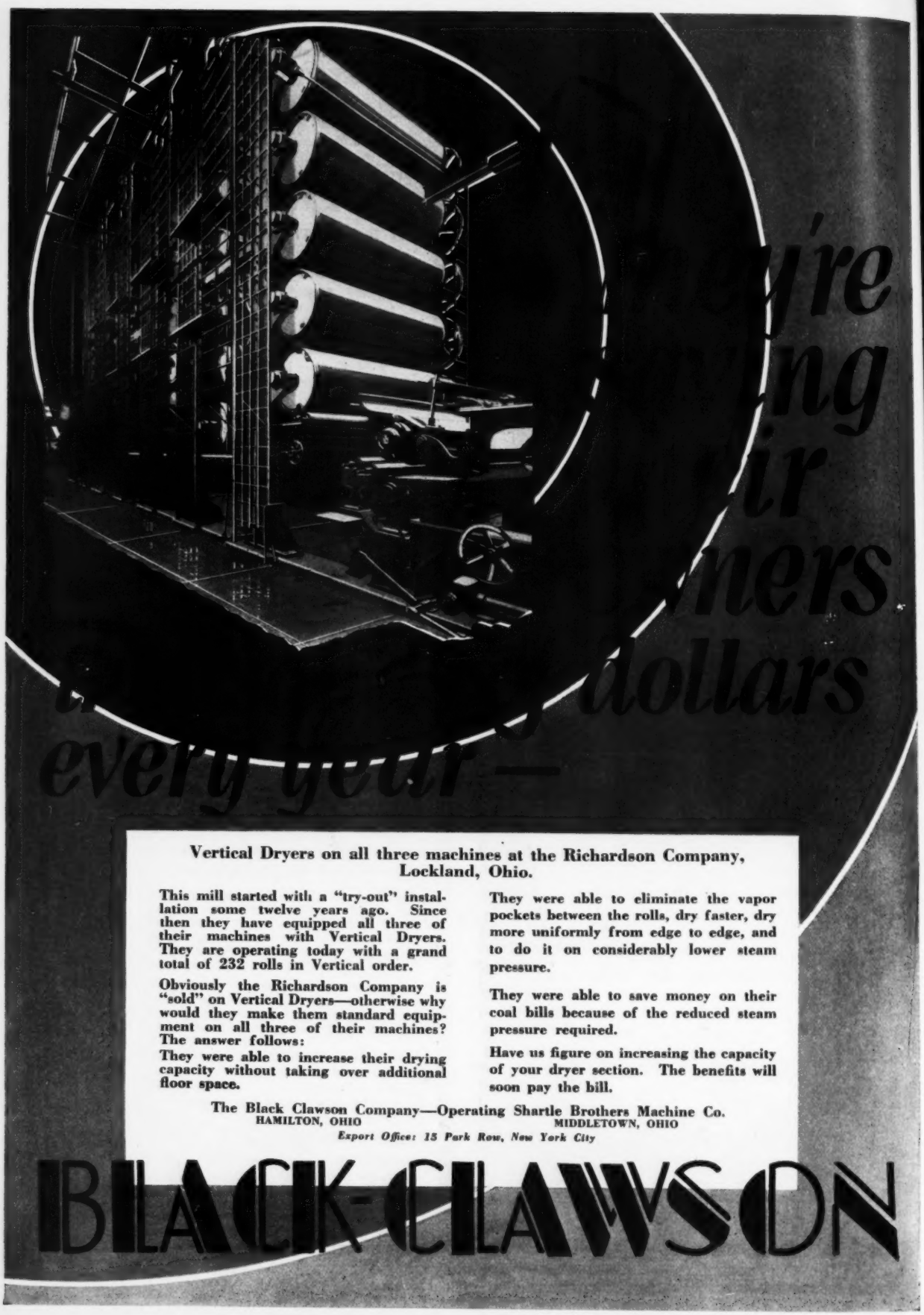


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This mill started with a "try-out" installation some twelve years ago. Since then they have equipped all three of their machines with Vertical Dryers. They are operating today with a grand total of 232 rolls in Vertical order.

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They were able to eliminate the vapor pockets between the rolls, dry faster, dry more uniformly from edge to edge, and to do it on considerably lower steam pressure.

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